

## Unit 1

## FORCE AND MOTION

Remember what you have learnt in this unit through the following points:

- 1 Definitions
- 2 Importance and uses
- 3 Give a reason for
- 4 What happens in the following cases?
- 5 Comparisons
- 6 Important devices
- 7 Mathematical formulae & conversions



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## 1. Definitions

Concept	Definition
<b>Mass</b>	<ul style="list-style-type: none"> <li>The amount of material (matter) in an object.</li> <li>The more matter an object contains, the greater its mass is.</li> </ul>
<b>Weight</b>	<ul style="list-style-type: none"> <li>The force by which a body is attracted to the earth. This force is always towards the center of the earth.</li> <li>It is the gravitational force by which the body is attracted to the center of the earth.</li> </ul>
<b>Spring scale</b>	A device which is used to measure weight.
<b>Newton</b>	The measurement unit of weight. The weight of an object whose mass is 100 g.
<b>Kilogram</b>	The measurement unit of large masses, and it is almost equal to the mass of 1 liter of distilled water.
<b>Gram</b>	The measurement unit of small masses, and it is almost equal to the mass of one paper clip.
<b>Ton</b>	The measurement unit of very large masses.
<b>Balance scale</b> <b>One-arm scale with pointer.</b>	A type of scales that is used to measure large masses such as fruits and vegetables.
<b>Sensitive scale</b> <b>One-arm digital scale</b>	A type of scales that is used to measure small masses such as gold and chemicals.

## 2. Importance and uses

Item	Importance and uses
<b>Balance scale</b>	Used to measure large masses such as fruits and vegetables.
<b>Spring scale</b>	Used to measure the weight of objects.
<b>Sensitive scale</b> <b>"Digital scale"</b>	Used to measure small masses such as gold and chemicals.
<b>Earth's gravity</b>	The force by which a body is attracted to the center of the earth.

## 3. Give a reason for

- The weight of a person on the earth is larger than his weight on the moon.
  - Because the earth has a greater mass and gravitational force than those of the moon, so the weight of a person on the earth is more than his weight on the moon.
- The moon's gravity is less than the earth's gravity.
  - Because the mass of the moon is less than the mass of the earth and as the mass of the planet increases, its gravitational force increases.
- The weight of any body differs according to the planet.
  - Because planets have different masses and gravitational forces.
- The weight of a person on a balloon is smaller than his weight on the earth.
  - Because as the distance from the center of the earth increases, the gravitational force decreases and the weight also decreases.
- Objects fall down towards the ground.
  - Due to weight (gravitational force).
- The wire of the spring scale expands when an object is hung to it.
  - Due to the weight of the object.

## 4. What happens in the following cases?






- Your weight on the moon with respect to the earth.
  - It will decrease to  $\frac{1}{6}$  of my weight on the earth.
- Your mass on the moon with respect to the earth.
  - It will not change.
- The weight if the mass increases.
  - Weight increases with the increase in the mass of objects.
- Your weight on the earth and in a balloon.
  - My weight on the earth will be more than my weight in the balloon.
- Your weight in space.
  - I have no weight as my weight is zero.
- You measured weight in different places on the earth.
  - It will change according to the distance from the center of the earth. If I am nearer to the center of the earth, my weight will increase and vice versa.

7. There is no gravity on the earth's surface.
- All bodies on the earth's surface move away from it and fly.
  - The moon moves away from the earth and won't revolve around it.
8. The distance between a person in a balloon and the center of the earth increases.
- The weight of the person decreases.

## 5. Comparisons

Points of comparison	Mass	Weight
<b>Definition</b>	• The amount of matter in an object.	• The force with which the body is attracted to the earth.
<b>Unit</b>	• Gram - Kilogram - Ton	• Newton
<b>Measuring tool</b>	• Balance scale • Sensitive scale • One-arm digital scale • One-arm scale with a pointer	• Spring scale
<b>Direction</b>	• Has no direction.	• Towards the center of the planet.
<b>Effects of different places</b>	• Constant (it does not change with the change of the place).	• Variable (it changes from a planet to another).

## 6. Important devices

Measurement tools of mass	Spring scale for measuring weight
<p><b>Two-arm scales</b></p>  <p>Balance scale</p>  <p>Sensitive scale</p>	<p><b>One-arm scales</b></p>  <p>One-arm scale with a pointer</p> <p>For large masses such as: fruits and vegetables.</p>  <p>One-arm digital scale</p> <p>For small masses such as: gold and chemicals.</p>
	 <p>Top hook</p> <p>Bottom hook</p> <p>Spring scale</p>

## 7. Mathematical formulae &amp; conversions

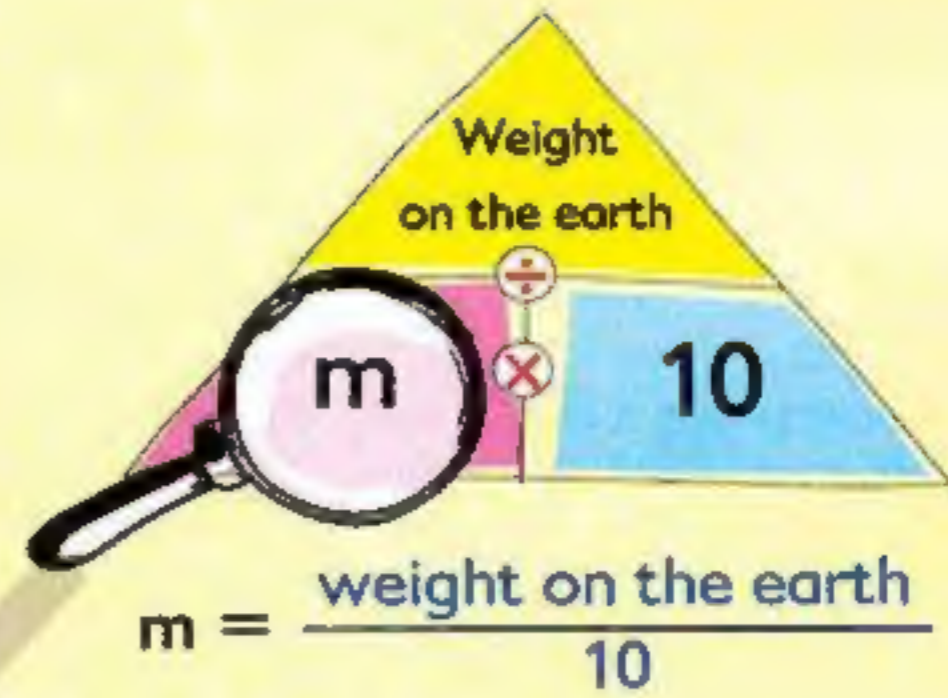
## Mass conversion diagram

- You can calculate the weight of an object on the earth's surface according to the following rule:

Object's weight on the earth = its mass (kg)  $\times$  10



$$\text{Weight on the earth} = m \text{ (kg)} \times 10$$



$$m = \frac{\text{weight on the earth}}{10}$$

- The acceleration of gravity of the earth (g) = 10 m/s<sup>2</sup>.
- The mass unit must be in (kg) when determining the weight.
- As mass increases, weight increases.



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## Unit 2

THERMAL  
ENERGY

**Remember what you have learnt in this unit through the following points:**

- |  |                      |
|--|----------------------|
| 1 Definitions                          | 5 Comparisons        |
| 2 Importance and uses                  | 6 Important diagrams |
| 3 Give a reason for                    | 7 Important points   |
| 4 What happens in the following cases? |                      |



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## 1. Definitions

Concept	Definition
<b>Heat</b>	A form of energy that transfers from an object of higher temperature to an object of lower temperature.
<b>Temperature</b> OR	The degree of hotness or coldness of a body.
<b>Good conductors of heat (Heat conductors)</b>	An indicator that helps us to express the state of a body as for hotness or coldness.
<b>Bad conductors of heat (Heat insulators)</b>	The materials that allow heat to flow through.
<b>Thermometer</b>	The materials that do not allow heat to flow through.
<b>Medical (Clinical) thermometer</b>	A device that is used to measure the temperature.
<b>Celsius thermometer</b>	The thermometer that is used in measuring the temperature of the human body.
	The thermometer that is used in measuring the temperature of liquids or weather.

## 2. Importance and uses

Item	Importance and uses
<b>Heat</b>	We use it: 1. At home for: • Warming houses • Drying washed clothes • Cooking • Water heating 2. In industry such as: • Food industry. • Paper, glass, textiles and other industries.
<b>Heat conductors (aluminum, copper and stainless steel)</b>	Making cooking pots and kettles.
<b>Heat insulators (plastic and wood)</b>	• Making handles of cooking pots and kettles. • Making the iron handle.
<b>Wool</b>	It is used in making woolen clothes and heavy blankets.

Item	Importance and uses
Plastic in the manufacture of a handle of iron	It doesn't allow heat to flow through.
Air	It is used in making insulating glass window.
Thermometer	It is used to measure the temperature.
Medical (Clinical) thermometer	It is used to measure the temperature of the human body.
Celsius thermometer	It is used to measure the temperature of liquids or atmosphere.
The constriction in the medical thermometer	It prevents mercury from going back to the bulb quickly in order to read the temperature easily.
Ethyl alcohol	It is used to sterilize the medical thermometer.
Digital thermometer	It is used to measure the temperature of the human body especially for children.
Mercury	It is the liquid metal used in making thermometers.
Mercury in making thermometer	It is used to measure the temperature.

### 3. Give a reason for

- Heat has great importance in industry.
  - Because we use it in many industries such as the industry of food, paper, glass and textiles.
- Heat is an important form of energy in our daily life.
  - Because we use it in:
    - Warming houses - Cooking - Drying washed clothes - Water heating
- Aluminum is a good conductor of heat.
  - Because it allows heat to flow through.
- Wool and plastic are heat insulators.
  - Because they do not allow heat to flow through.
- Aluminum differs from plastic in conducting heat.
  - Because aluminum allows heat to flow through, while plastic does not allow heat to flow through.
- A space filled with air is left between the two glass sheets of the insulating glass window.
  - To prevent the leakage of heat as air is a bad conductor of heat.

7. Gaps are left between the railway bars.
  - To avoid train accidents as iron is a good conductor of heat that expands and twists by heat.
8. Cooking pots are made of aluminum or stainless steel.
  - Because aluminum and stainless steel are good conductors of heat.
9. Clothes made of wool are used in winter.
  - To keep the body warm as wool is a bad conductor of heat.
10. Heat conductors have great importance in our daily life.
  - Because they are used in making cooking pots and kettles.
11. Heat insulators are very important in our life.
  - Because they are used in making handles of cooking pots and kettles to prevent the transfer of heat.
12. Measuring temperature is important in our daily life.
  - Because:
    - This helps us to know our bodies' temperature to check our health conditions.
    - This helps us to know the weather temperature which affects our life activities.
    - This is important for some food industries that require a certain temperature.
13. On touching a cube of ice, you feel cold.
  - Due to the transfer of heat from my hand to the cube of ice.
14. On touching a cup of tea, you feel hot.
  - Due to the transfer of heat from the cup of tea to my hand.
15. We cannot depend on touching to measure the temperature of objects.
  - Because the sense of touching helps us to find out if the object is hot or cold, but it is not an accurate method for measuring temperature.
16. In the medical thermometer, there is a constriction above the mercury bulb.
  - To prevent mercury from going back to the bulb quickly in order to read the temperature easily.
17. The medical thermometer must be sterilized before using.
  - To kill microbes.
18. We must shake the medical thermometer well before using it.
  - To force the mercury to go back to the bulb.
19. The clinical thermometer must be dipped in ethyl alcohol before using.
  - To sterilize it as ethyl alcohol kills microbes.
20. We cannot use the clinical thermometer in measuring the temperature of boiling water.
  - Because the scale of the medical thermometer ends at  $42^{\circ}\text{C}$ , while the temperature of boiling water is  $100^{\circ}\text{C}$ , so mercury will expand more and more until the bulb is broken.

21. The temperature of ice cannot be measured using the clinical thermometer.
  - Because the scale of the medical thermometer starts at  $35^{\circ}\text{C}$ , while the temperature of iced water is  $0^{\circ}\text{C}$ .
22. The thermometer must be kept out of reach of children.
  - It is dangerous to seize the thermometer firmly with our teeth.
  - Or In order not to be broken as mercury is toxic.
23. The scale of the medical thermometer ends at  $42^{\circ}\text{C}$ .
  - Because the temperature of the human body cannot exceed this degree.
24. Mercury is used in making thermometers.
  - Because:
    - It is a liquid metal that can be seen easily through the capillary tube.
    - It is a good conductor of heat.
    - It expands regularly to give an accurate measurement.
    - It does not stick to the walls of the capillary tube.
    - It gives a wide range between  $-39^{\circ}\text{C}$  to  $357^{\circ}\text{C}$  to measure temperature.

#### 4. What happens in the following cases?

1. No gaps are left between the railway bars.
  - Train accidents may occur as iron is a good conductor of heat and expands and twists by heat.
2. You hold a glass of tea by your hand.
  - I feel hot due to the transfer of heat from the cup of tea to my hand.
3. You hold a cube of ice by your hand.
  - I feel cold due to the transfer of heat from my hand to the cube of ice.
4. You touch one end of an aluminum rod while the other end is inserted in a beaker containing hot water.
  - I feel hot because aluminum is a good conductor of heat.
5. You touch one end of a rod of wood while the other end is inserted in a glass of hot water.
  - I do not feel hot because wood is a bad conductor of heat.
6. Handles of cooking pots are made of aluminum.
  - We cannot hold them by our hands because aluminum is a good conductor of heat.
7. There is no constriction in the medical thermometer.
  - Mercury will go back to the bulb quickly and we cannot record the temperature reading.

## Final Revision

8. The clinical thermometer is put in boiling water.
  - Mercury will expand more and more until the bulb is broken.
  - The highest degree of the clinical thermometer is  $42^{\circ}\text{C}$  and the boiling point of water is  $100^{\circ}\text{C}$ .
9. You press firmly by your teeth on the medical thermometer.
  - The thermometer will be broken and mercury will harm me as it is toxic.
10. We use the medical thermometer without sterilizing it.
  - We may be infected by some diseases.
11. You use the medical thermometer without shaking it.
  - Reading the temperature will be incorrect.
12. Mercury is replaced by water in making thermometers.
  - The thermometer cannot measure the temperature.
13. All substances that man uses are good conductors of heat.
  - We cannot make handles of the iron, cooking pots and kettles.

## 5. Comparisons

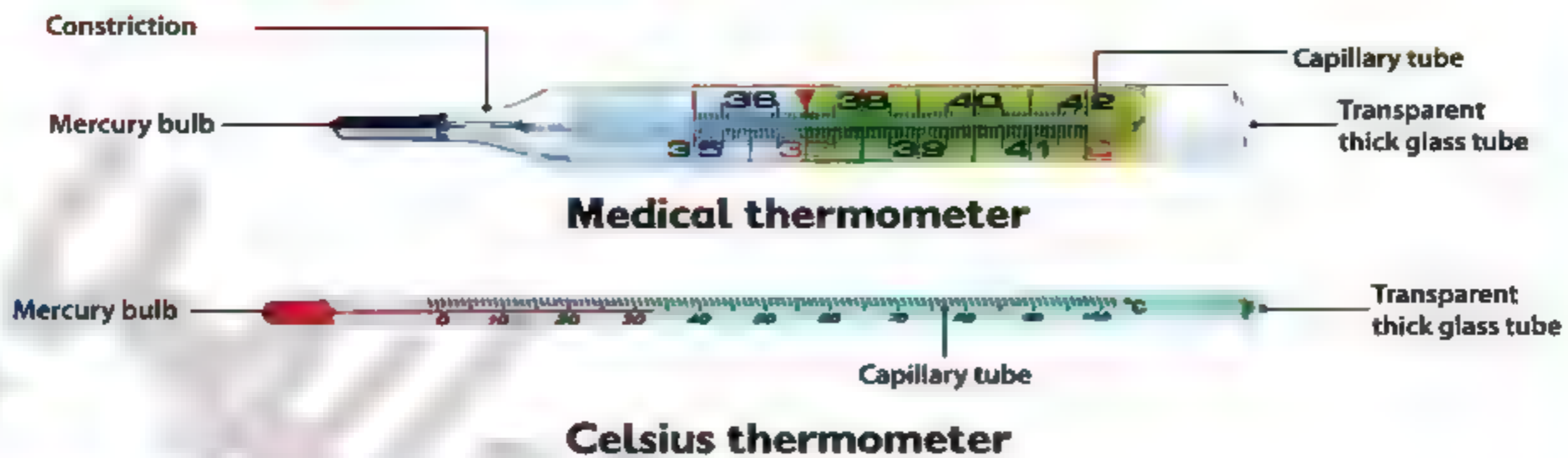
1.

P.O.C.	Heat conductors	Heat insulators
Definition	• They are the materials that allow heat to flow through.	• They are the materials that do not allow heat to flow through.
Examples	• Iron – copper – aluminum – stainless steel.	• Wood – plastic – glass – paper – wool – rubber – liquids – gases (air).
Uses	• Making cooking pots and kettles.	• Making the handles of cooking pots and kettles. • Making the handles of the iron.

2.

P.O.C.	Medical thermometer	Celsius thermometer
Range of scale	From $35^{\circ}\text{C}$ to $42^{\circ}\text{C}$	From $0^{\circ}\text{C}$ to $100^{\circ}\text{C}$
Constriction	Present	Absent
Used liquid	Mercury	Mercury
Uses	It is used to measure the temperature of the human body.	It is used to measure the temperature of liquids.

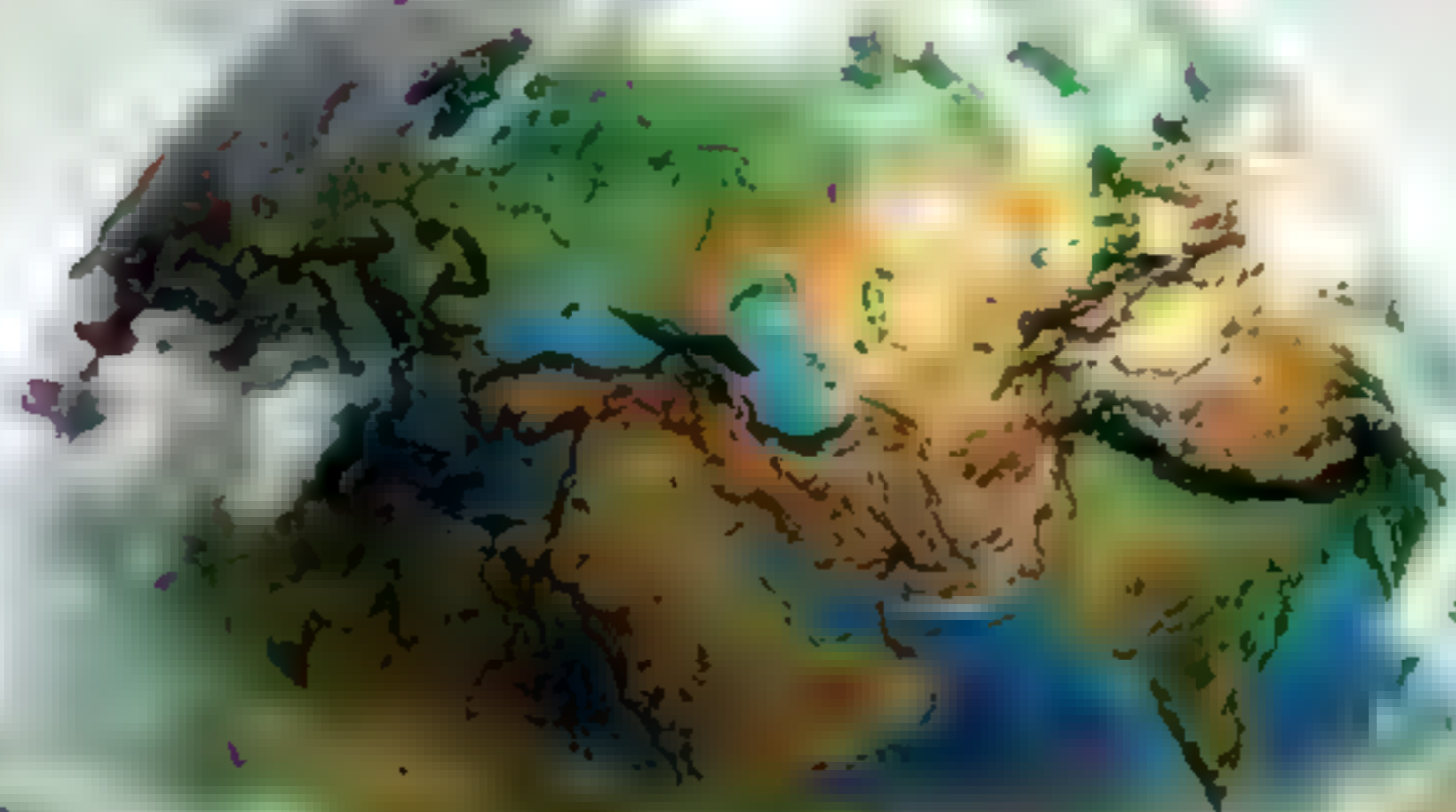
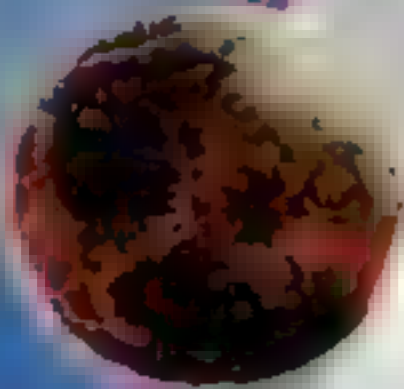
## 6. Important diagrams



## 7. Important points

1. Materials differ in their ability to conduct heat.
2. Materials are divided into:
  - Good conductors of heat (heat conductors)
  - Bad conductors of heat (heat insulators)
3. All metals are good conductors of heat.
4. Metals differ in their ability to conduct heat where:
  - Copper conducts heat faster than aluminum and iron.
  - Aluminum conducts heat faster than iron.
5. There are two main types of thermometers:
  - Medical thermometer
  - Celsius thermometer
6. The temperature of a healthy human is  $37^{\circ}\text{C}$  and it may rise during sickness.
7. The medical thermometer consists of:
  - A transparent glass tube with a capillary tube closed from one of its ends.
  - The other end of the capillary tube is connected to a bulb filled with mercury.
  - There is a constriction above the mercury bulb.
8. Steps of measuring our body temperature:
  - Sterilize the medical thermometer by using ethyl alcohol.
  - Dry the thermometer using tissue paper.
  - Shake the thermometer well.
  - Put the thermometer under your tongue for a minute.
  - Get the thermometer out from the mouth, and then record the reading.
  - Sterilize the thermometer again and put it in its box.

## Unit 3

THE  
ATMOSPHERE

**Remember what you have learnt in this unit through the following points:**

- |  |                     |
|--|---------------------|
| 1 Definitions                          | 5 Comparisons       |
| 2 Importance and uses                  | 6 Important figures |
| 3 Give a reason for                    | 7 Important points  |
| 4 What happens in the following cases? |                     |



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## 1. Definitions

Concept	Definition
Earth's atmosphere	A mixture of gases (with different percentages) surrounding the earth and attracted to it by the effect of the gravitational force.
Photosynthesis	The process that is performed by green plants that absorb carbon dioxide from air to produce food and oxygen.
Hydrogen peroxide	(Oxygen water): a chemical substance used to prepare oxygen gas.
Catalyst	A chemical substance that is used in chemical reactions to speed up the rate of reaction without any change in its quantity or properties.
Oxidation	A slow combination of oxygen with most elements in humid air forming oxides compounds.
Combustion	A rapid combination of oxygen with elements forming oxides.
Respiration	A food burning process in living bodies to produce energy and carbon dioxide.
Manganese dioxide	A catalyst used in the preparation of oxygen gas.
Ozone layer	An atmospheric layer consisting of ozone gas that protects the earth from harmful radiations (ultraviolet rays).
Oxyacetylene flame	It is formed by burning a mixture of oxygen and acetylene gas that gives a temperature of $3500^{\circ}\text{C}$ .
Global warming	The increasing of earth's temperature due to the increase in carbon dioxide percentage.
Limewater	<ul style="list-style-type: none"> <li>• The chemical substance that is used to detect the presence of carbon dioxide.</li> <li>• The chemical substance that turns milky by carbon dioxide.</li> </ul>
Fermentation	The process that is performed by adding yeast fungus to dough on making bread.
Dry ice	It is formed when carbon dioxide is converted into a liquid by pressure and cooling, then relieving pressure.
Nitrogen oxide	Gases formed by lightning and moved to the earth through rain.

## 2. Importance and uses

Item	Importance and uses
<b>Oxygen gas</b>	<ol style="list-style-type: none"> <li>1. An essential element in water molecule.</li> <li>2. Oxygen is essential in respiration and food burning processes to produce energy for other biological vital processes.</li> <li>3. Oxygen gas is compressed inside oxygen cylinders for different usages: <ol style="list-style-type: none"> <li>a. Artificial respiration for people who suffer from difficulty in respiration process.</li> <li>b. During surgical operations.</li> <li>c. Diving underwater.</li> <li>d. Mountain climbers.</li> <li>e. Oxygen is mixed with acetylene gas to form oxyacetylene flame (<math>3500^{\circ}\text{C}</math>) that is enough to melt metals to be used in welding and cutting of metals.</li> <li>f. Ozone molecule is formed by the combination of three oxygen atoms and it forms a layer in the atmosphere called ozone layer, which protects the earth from harmful rays coming from the sun.</li> </ol> </li> </ol>
<b>Carbon dioxide gas</b>	<ol style="list-style-type: none"> <li>1. Refrigeration: on converting it into a liquid by pressure and cooling, then pressure is relieved forming dry ice that we use in refrigeration.</li> <li>2. It is used in extinguishing fires because it does not burn and does not help in burning.</li> <li>3. It is used to make soft drinks.</li> <li>4. It is used to make bread bubbled (spongy), where yeast produces carbon dioxide by fermentation when it is added, then carbon dioxide expands due to the heat making bread porous and tasty.</li> <li>5. Carbon dioxide contributes in photosynthesis process in green plants leading to the production of food as well as the production of oxygen.</li> </ol>
<b>Nitrogen gas</b>	<ol style="list-style-type: none"> <li>1. It is used in filling car tires for the relative constancy of its volume at the change of temperature.</li> <li>2. It contributes in composing gunpowder and ammonium nitrates included in the composition of soil fertilizers.</li> <li>3. It is used in the manufacture of ammonia to produce fertilizers.</li> <li>4. It is used as an inactive material in the tanks of liquefied explosives and during the manufacture of electronic devices.</li> </ol>

	5. It is used to make stainless steel.
	6. Small amounts of nitrogen are used to fill some types of lamps.
	7. It is used to store petroleum and some flammable materials.
<b>Liquid nitrogen</b>	1. Cooling food and medicines 2. Treatment of skin tumors.
<b>Catalyst</b>	It speeds up the rate of chemical reactions without changing its quantity or properties.
<b>Ozone layer</b>	It protects the earth from harmful radiations.
<b>Atmosphere</b>	It protects the earth by absorbing ultraviolet radiation coming from outer space - it adjusts the temperature of the earth.
<b>Soil bacteria</b>	They help legumes to make their protein.

### 3. Give a reason for

- The ratio of  $O_2$  is constant in the atmosphere although it is consumed in respiration.
  - Because it is produced by plants during photosynthesis process to compensate the ratio consumed in respiration.
- The water level in the cylinder rises up when the candle is put out.
  - To compensate (replace) the amount of  $O_2$  consumed in the candle burning.
- Adding manganese dioxide in oxygen preparation.
  - To act as a catalyst which helps in dissociation of hydrogen peroxide to produce  $O_2$  and water.
- The color of litmus paper does not change with  $O_2$ .
  - Because  $O_2$  has a neutral effect on litmus paper.
- Bridges made of iron are painted.
  - To prevent them from erosion by iron rust.
- Mountain climbers carry oxygen cylinders.
  - Because oxygen becomes lighter when we rise above the earth's surface.
- Using oxyacetylene flame in cutting metals.
  - Because its temperature reaches  $3500^\circ\text{C}$  which is enough to melt metals.
- The atmosphere has great importance to living organisms on the earth.
  - Because it absorbs the ultraviolet radiation from outer space and it adjusts the temperature on the earth's surface.
- The mass of a piece of cleansing wire increases after burning.
  - Because oxygen combines with iron forming an iron oxide.

## General &amp; Final Revision

10. Carbon dioxide gas is collected by the upward displacement of air.
  - Because it is heavier than air.
11. Oxygen is collected by the downward displacement of water.
  - Because oxygen scarcely dissolves in water.
12. Decomposition of hydrogen peroxide into water and oxygen occurs quickly.
  - Due to the presence of manganese dioxide.
13. When you turn a cylinder filled with oxygen over another cylinder filled with air, oxygen replaces air in the lower cylinder.
  - Because oxygen is heavier than air.
14. If you put litmus paper (red - blue) in a cylinder filled with oxygen, it does not change.
  - Because oxygen has a neutral effect.
15. Nitrogen is used in filling car tires.
  - Because it has a relative constant volume that does not change by changing temperature.
16. Nitrogen is used to store petroleum and some flammable materials.
  - Because it is an inactive gas.
17. Manganese dioxide remains without change in quantity and properties during the preparation of oxygen.
  - Because it works as a catalyst that speeds up the reaction without being changed.
18. Ozone layer has great importance.
  - Because it protects the earth from harmful radiations.
19. Clear limewater is used to detect the presence of  $\text{CO}_2$  gas.
  - Because  $\text{CO}_2$  gas makes clear limewater turbid by forming calcium carbonate (white precipitate) that does not dissolve in water.
20. Limewater becomes milky when carbon dioxide gas passes through it.
  - Due to the formation of calcium carbonate.
21.  $\text{CO}_2$  gas is used in extinguishing fires.
  - Because  $\text{CO}_2$  gas does not burn and does not help in burning.
22. Yeast is added to dough in making bread.
  - Because yeast produces  $\text{CO}_2$  gas by fermentation that expands by heat making bread spongy and tasty.
23. The environment suffers from the increase of  $\text{CO}_2$  gas.
  - Due to:
    1. The removal of forests.
    2. Burning of massive amounts of fuel in industry and means of transportation engines.

24.  $\text{CO}_2$  gas has great importance for the continuity of life.
  - Because green plants take  $\text{CO}_2$  gas to make photosynthesis process that helps in making the food and nutrients for all living organisms.
25. The increase of  $\text{CO}_2$  gas amount is harmful.
  - Because the increase of  $\text{CO}_2$  gas leads to:
    1. Raising the earth's temperature (global warming).
    2. Suffocation of living organisms.
26. Drinking too much of soda water is unhealthy.
  - Because it does not contain any nutrients except sugar and it contains a large amount of  $\text{CO}_2$  gas.
27.  $\text{CO}_2$  gas is called a silent killer.
  - Because man gets suffocated if he breathes  $\text{CO}_2$  gas which is colorless, tasteless and odorless.
28. The main source of  $\text{N}_2$  gas is air.
  - Because the air contains 78% of  $\text{N}_2$  gas.
29. We prepare  $\text{N}_2$  gas by passing air across sodium hydroxide or potassium hydroxide.
  - To absorb  $\text{CO}_2$  gas from air.
30. We prepare  $\text{N}_2$  gas by passing air across hot copper wire.
  - To get rid of oxygen where copper combines with oxygen in air.
31. Nitrogen contributes in the composition of all living tissues.
  - Because nitrogen is the main component of proteins that build up tissues of living organisms.
32. Nitrogen gas is collected by downward displacement of water.
  - Because nitrogen scarcely dissolves in water.
33. Nitrogen gas is called azote which means lifeless.
  - Because nitrogen gas does not help in burning and does not include respiration process of living organisms.
34. Carbon dioxide gas is not collected by downward displacement of water.
  - Because carbon dioxide easily dissolves in water.
35. A pungent odor is evolved as a result of the addition of water to the product of burning magnesium in nitrogen.
  - Due to the formation of ammonia gas.
36. Although smoke and dust are air pollutants, they help in the formation of rain or snow.
  - Because they help in condensation of water vapor.
37. Liquid nitrogen is used for cooling food and medicines.
  - To preserve them from heat.






#### 4. What happens in the following cases?

- There is no atmospheric air.
  - The harmful radiations (ultraviolet rays) that come from the sun will reach the earth.
- There is no oxygen in the atmosphere.
  - There will be no life because living organisms will not be able to respire.
- The percentage of oxygen gas in air is more than 21%.
  - Burning process will not be controlled.
- If you put red or blue litmus paper in a cylinder full of oxygen.
  - The color of red or blue litmus paper will not change as oxygen has a neutral effect on it.
- Most forests on the earth are removed.
  - The ratio of carbon dioxide will increase in air which causes an increase in the temperature.
- You blow in a jar containing clear limewater.
  - Limewater will turn milky due to the presence of carbon dioxide.
- The pressure on liquefied carbon dioxide is relieved.
  - Dry ice will be formed.
- One carbon atom combines with two oxygen atoms.
  - A molecule of carbon dioxide will be produced.
- Nitrogen gas is not present in the atmospheric air.
  - Proteins in living tissues will not be formed and the effect of oxygen in helping burning will increase.
- Atmospheric air is passed over sodium or potassium hydroxide.
  - Carbon dioxide will be removed from air.
- A wet litmus paper is exposed to ammonia gas.
  - The red litmus will turn blue because it is alkaline.
- Oxygen reacts with nitrogen during lightning.
  - Nitrogen dioxide gas will be formed and it will dissolve in rain.
- Getting rid of soil bacteria.
  - Legumes will not have proteins.
- The percentage of carbon dioxide increases.
  - The earth's temperature will increase (global warming).
- A lighted candle is put in a cylinder filled with carbon dioxide gas.
  - It will be put out.
- A lighted magnesium ribbon is put in a jar of carbon dioxide.
  - It will burn giving a white substance of magnesium oxide and a black deposit of carbon.

17. A lighted magnesium ribbon is put in a jar of oxygen.
  - It will continue to burn giving a white powder of magnesium oxide.
18. Yeast is added to dough on making bread.
  - Because fermentation will produce carbon dioxide that makes bread spongy and tasty.
19. Leaving iron nails in moist air for a long time.
  - Rust will be formed.
20. You add dilute hydrochloric acid to calcium carbonate.
  - They will react giving carbon dioxide gas.
21. Putting a lighted candle in a jar of nitrogen.
  - It will be put out.
22. Atmospheric air is passed over sodium hydroxide or potassium hydroxide.
  - They will absorb carbon dioxide and remove it from the atmospheric air.
23. If you put a litmus paper in a jar containing ammonia gas.
  - The red litmus paper will turn blue because ammonia has an alkaline effect on litmus paper.
24. A lighted magnesium ribbon is put in a jar of nitrogen.
  - A white substance will be formed and then after adding some water ammonia gas will be produced.

## 5. Comparisons

1. P.O.C	Oxidation	Combustion
<b>Speed</b>	Slow process	Quick process
<b>Process</b>	<ul style="list-style-type: none"> <li>• Combining of an element with oxygen.</li> <li>• In humid air forming oxide.</li> </ul>	<ul style="list-style-type: none"> <li>• Combining of an element with oxygen.</li> <li>• By burning, forming oxides and producing heat and light.</li> <li>• <b>Example:</b> Burning of a piece of cleansing wire.</li> </ul>

2. Oxygen	Ozone	Carbon dioxide	Nitrogen	Water
 O <sub>2</sub>	 O <sub>3</sub>	 CO <sub>2</sub>	 N <sub>2</sub>	 H <sub>2</sub> O

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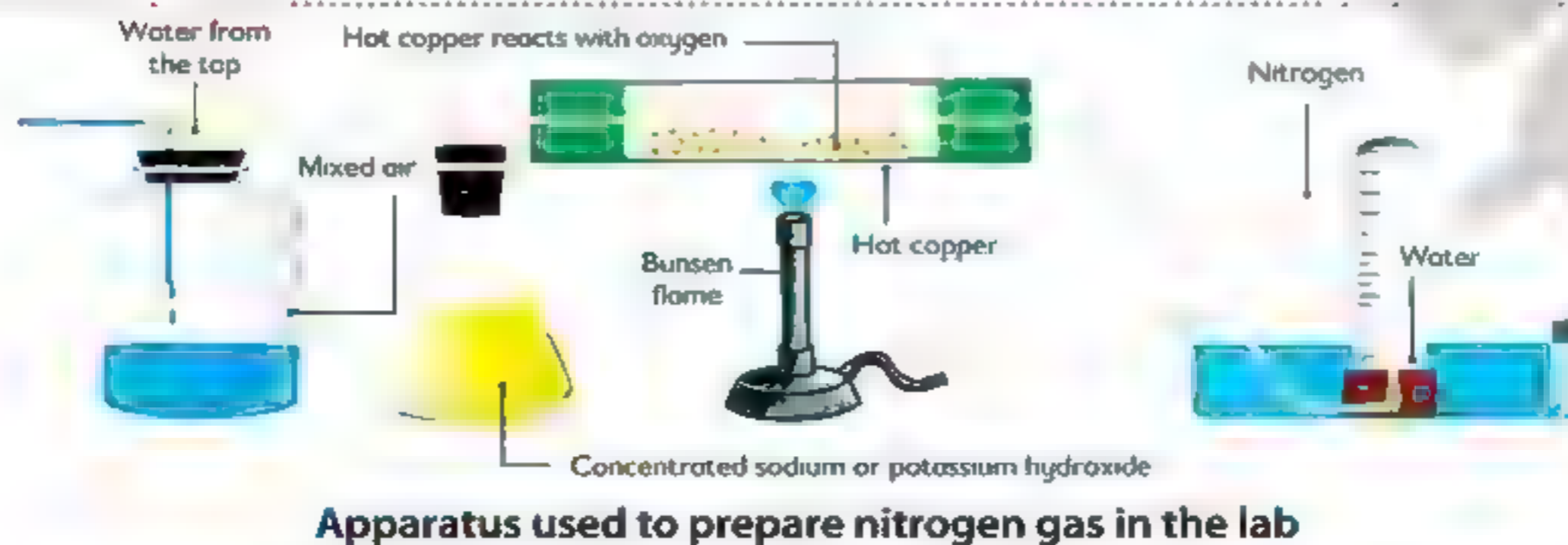
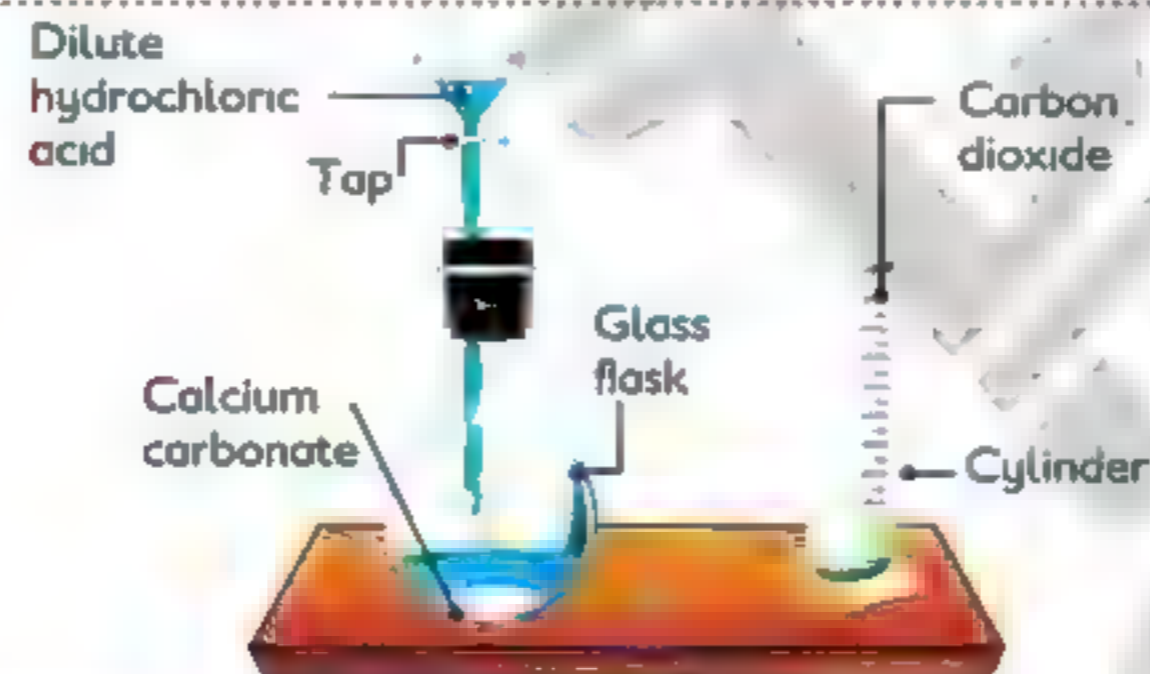
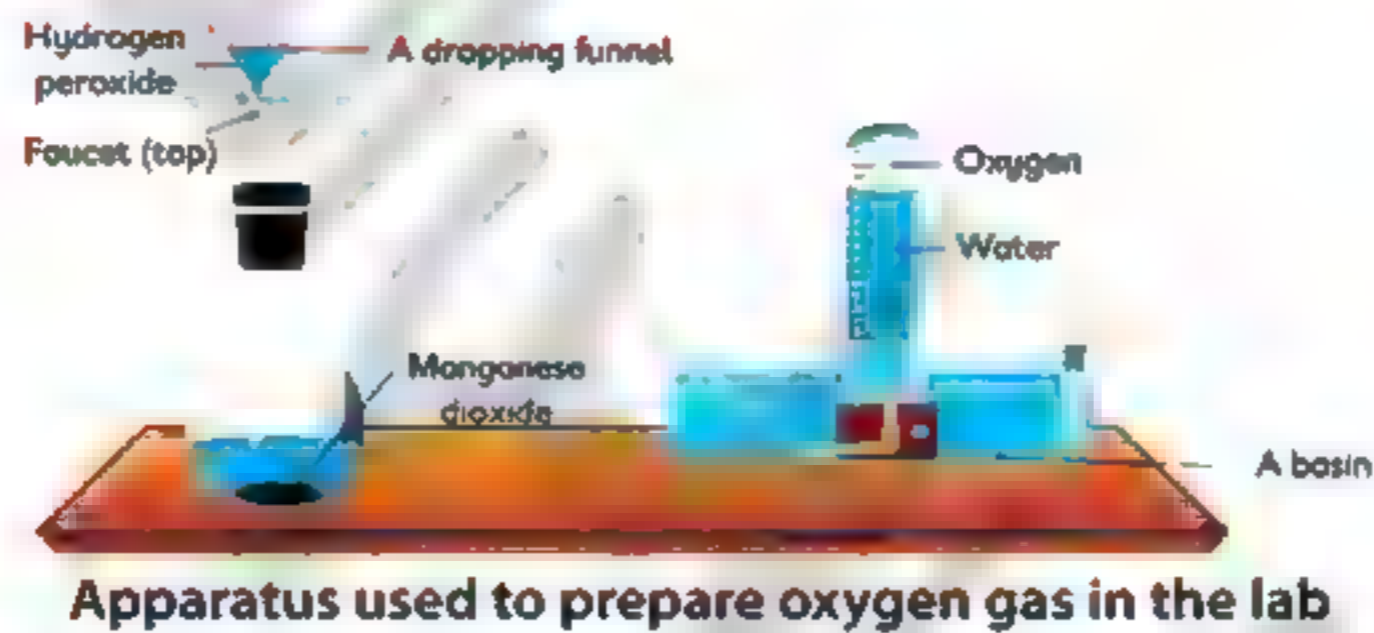
3.

P.O.C.	Oxygen	Carbon dioxide	Nitrogen
1. Source	• Photosynthesis process.	• Respiration process.	• Air
2. Its percentage	21%	0.03%	78%
3. The chemical materials used in lab preparation	• Adding hydrogen peroxide to manganese dioxide.	• Adding dilute hydrochloric acid to calcium carbonate.	• Passing air through concentrated sodium or potassium hydroxide then hot copper.
4. Physical properties	• Colorless, tasteless and odorless.	• Colorless and odorless.	• Colorless, tasteless and odorless.
5. Weight	• Heavier than air.	• Heavier than air.	
6. Burning	• It does not burn, but it helps in burning.	• It does not burn and does not help in burning.	• It does not burn and does not help in burning.
7. Reaction with magnesium	• The lighted magnesium ribbon gives a white powder of magnesium oxide.	• The lighted magnesium ribbon gives white powder of magnesium oxide and black carbon deposits on the wall of the cylinder.	• The lighted magnesium ribbon gives a white powder, dissolves in water giving ammonia which has an alkaline effect on litmus paper (turns red into blue). • Ammonia has a pungent smell.
8. Dissolving in water	• It scarcely dissolves in water.	• It easily dissolves in water.	• It scarcely dissolves in water.
9. Effect on limewater	• No effect.	• It turns limewater turbid (milky).	• No effect.
10. Uses	• Oxyacetylene flame used in cutting and welding of metals.	• Fire extinguishers.	• Filling car tires and some types of lamps.

4.

P.O.C	Preparation
Oxygen	From hydrogen peroxide. • Hydrogen peroxide $\xrightarrow[\text{catalyst}]{\text{manganese dioxide}}$ oxygen water
Carbon dioxide	From calcium carbonate. • Calcium carbonate + dilute hydrochloric acid $\longrightarrow$ CO <sub>2</sub>
Nitrogen	From air by: • Passing air over concentrated sodium hydroxide to absorb carbon dioxide gas. • Passing air over hot copper to absorb oxygen gas.

## 6 Important figures



## 7. Important points

### Components of the atmosphere:

1. Nitrogen gas which forms 78% of the air volume.
  2. Oxygen gas which forms 21% of the earth's atmosphere.
  3. The rest of the earth's atmosphere consists of 1% carbon dioxide, water vapor and other gases like argon, neon and helium.
- The only source of oxygen is green plants on the earth.

### Properties of oxygen gas:

1. Oxygen is colorless, odorless and tasteless.
2. Oxygen is scarcely (slightly) soluble in water.
3. Oxygen gas does not burn, but it helps in burning.
4. Oxygen is neutral. **G.R.**
  - Because it has no effect on blue or red litmus paper.
5. Oxygen is heavier than air, so it can displace air.
6. Oxygen combines with most elements forming oxides.

### Sources of carbon dioxide gas:

Carbon dioxide ( $\text{CO}_2$ ) is produced from burning of organic compounds such as:

1. Wood.
2. Coal.
3. Oil.
4. Gasoline.
5. Tobacco (materials from which cigarettes are made).

### Properties of carbon dioxide gas:

1. It is colorless and odorless.
  2. It is heavier than air so it is collected by displacing air upwards and replacing it.
  3. It easily dissolves in water, so it is not collected by displacing water as in the case of oxygen.
  4. It does not burn and does not help in combustion, so it is used for extinguishing fires.
  5. The magnesium ribbon keeps burning and turns into a magnesium oxide (with white color) and the carbon (coal) deposits on the wall of the cylinder.
- Carbon dioxide contributes in photosynthesis process in green plants leading to the production of food as well as the production of oxygen.
  - Adding lemon juice to sodium bicarbonate produces carbon dioxide gases.

### Properties of nitrogen gas:

1. Nitrogen is a colorless, tasteless and odorless gas.
2. It scarcely dissolves in water.
3. It does not burn and does not help in burning.
4. It combines with a lighted magnesium ribbon composing a white substance. By adding a little water, a very pungent smell of "ammonia" emits.
5. Nitrogen can be condensed to a liquefied state.
6. Red litmus paper turns blue, and that shows the presence of a basic nitrogen compound like ammonia.
7. Nitrogen gas has a neutral effect on litmus paper.

## Unit 4

STRUCTURE AND  
FUNCTION OF LIVING  
ORGANISMS

**Remember what you have learnt in this unit  
through the following points:**

- ① Definitions
- ② Importance and uses
- ③ Locate the following structures in the human body
- ④ Important numbers and their indications
- ⑤ Give a reason for
- ⑥ What happens in the following cases?
- ⑦ Comparisons
- ⑧ Important diagrams
- ⑨ Important figures
- ⑩ Important points



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## 1. Definitions

Concept	Definition
<b>The nervous system</b>	A communicating and controlling body system.
<b>Nerve cell (neuron)</b>	The building unit of the nervous system.
<b>Neuron body (cell body)</b>	The part of the neuron that contains a nucleus, cytoplasm and plasma membrane and some branches called dendrites that extend from it.
<b>Dendrites</b>	Branches extending from the neuron body.
<b>Synapse</b>	The site of connection between dendrites of two neighboring neurons.
<b>Axon of the neuron</b>	A cylindrical axis connected with the cell body and covered with a fatty layer called myelin sheath.
<b>Myelin sheath</b>	A fatty layer covers the axon of the neuron.
<b>Axon terminals</b>	They are nerve endings located at the end of the axon.
<b>Central nervous system</b>	The brain and the spinal cord.
<b>Brain</b>	A nerve block containing millions of nerve cells and it is the main control center in the body.
<b>Cerebral cortex</b>	It is the outer surface of cerebrum, its color is grey and it has many convolutions and folds.
<b>Cerebrum (cerebral hemispheres)</b>	The largest part of the brain.
<b>Cerebellum</b>	The part of the brain that lies at the back area of the brain below the cerebrum and keeps the body balance during movement.
<b>Medulla oblongata</b>	The part of the brain that lies in front of the cerebellum and is responsible for regulating involuntary processes.

## Unit 4 Structure and Function of Living Organisms

**Spinal cord**

A cylindrical cord from which the spinal nerves extend. It consists of internal grey matter and it has the shape of the letter (H) surrounded by a white matter.

**Peripheral nervous system**

The nerves which emerge from the central nervous system.

**Cranial nerves**

They are 12 pairs of nerves emerging from the brain.

**Spinal nerves**

They are 31 pairs of nerves emerging from the spinal cord.

**Reflex action**

The automatic (spontaneous) response of the body to different stimuli.

**Movement**

The ability of an organism to change its position from a place to another.

**Locomotory system**

The system that is responsible for the body movement.

**Skeletal system**

The system that consists of the axial skeleton and the appendicular skeleton.

**Axial skeleton**

The part of the skeletal system that includes the skull, backbone and rib cage.

**Skull**

A bony box containing cavities for eyes, ears and the nose.

**Backbone**

An axis of skeleton that consists of a series of 33 vertebrae surrounding the spinal cord.

**Rib cage**

A cage that consists of 12 pairs of ribs surrounding the heart and lungs.

**Appendicular skeleton**

The part of the skeletal system that includes bones of the upper and lower limbs.

**The joint**

The location at which bones meet each other.

**Immovable joints**

The joints which do not allow any movement.

**Slightly movable joints**

The joints which allow movement in one direction only.

**Freely movable joints**

The joints which allow movement in all directions.

**Tendons**

Long strips that fix the muscles to bones.

**Voluntary muscles**

The muscles that you can move willingly.

**Involuntary muscles**

The muscles that work automatically and you cannot control their movements.



## 2. Importance and uses

Item	Importance and uses
<b>The nervous system</b>	<ul style="list-style-type: none"> <li>• It carries nerve messages from one of the areas of the body to another area.</li> <li>• It regulates and coordinates all the vital processes within the body.</li> <li>• It receives the external stimuli that surround the human being through the sensory organs and identifies and interprets them.</li> </ul>
<b>Dendrites</b>	<ul style="list-style-type: none"> <li>• They connect between the neighboring neurons.</li> </ul>
<b>Axon terminals</b>	<ul style="list-style-type: none"> <li>• They are connected to muscles or form a synapse with other neurons.</li> </ul>
<b>Brain</b>	<ul style="list-style-type: none"> <li>• It is the main control center in the body as it directs and coordinates all the processes, ideas, behaviors and emotions.</li> </ul>
<b>Cerebrum (Cerebral hemispheres)</b>	<ul style="list-style-type: none"> <li>• It controls the voluntary movements of the body like running in races.</li> <li>• It receives nerve impulses from sense organs (eyes, ears, nose, tongue and skin) and sends responses.</li> <li>• It contains the centers of thinking and memory.</li> </ul>
<b>Cerebellum</b>	<ul style="list-style-type: none"> <li>• It keeps the body balance during the movement.</li> </ul>
<b>Medulla oblongata</b>	<ul style="list-style-type: none"> <li>• It is responsible for regulating the involuntary processes of the body such as:               <ul style="list-style-type: none"> <li>- Heartbeats.</li> <li>- Movement of the respiratory system during breathing.</li> <li>- Movement and the function of the digestive system.</li> </ul> </li> </ul>
<b>Spinal cord</b>	<ul style="list-style-type: none"> <li>• It delivers nerve messages from body organs to the brain and vice versa.</li> <li>• It is responsible for reflexes.</li> </ul>
<b>Peripheral nervous system</b>	<ul style="list-style-type: none"> <li>• It delivers sensory information and kinetic responses between the central nervous system and all the body parts.</li> </ul>
<b>Skull</b>	<ul style="list-style-type: none"> <li>• It protects the brain and holds eyes, ears and the nose.</li> </ul>

## Unit 4 Structure and Function of Living Organisms

**Backbone**

- It allows the body to bend in different directions.
- It protects the spinal cord.

**Cartilages**

- They prevent friction of vertebrae during movement.

**Rib cage**

- It protects lungs and the heart.
- It helps in inhalation and exhalation processes.

**Upper limbs**

- They permit eating, drinking, writing and holding things.

**Lower limbs**

- They permit walking, running, standing and sitting.
- They carry the rest of the body.

**Joints**

- They allow the movement between bones.

**The muscular system**

- It acts as the engine of our body as it generates mechanical energy that moves our body.

**Tendons**

- They fix the muscles to bones.

**Slightly movable joints**

- The joints that allow for movement in one direction.

**Freely movable joints**

- The joints that allow for movement in different directions.

**3. Locate the following structures in the human body:**

Structure	Its location
<b>Dendrites</b>	Extending from the neuron's body
<b>Axon terminals</b>	At the end of the neuron's axon.
<b>The brain</b>	Inside the skull.
<b>Cerebrum (cerebral hemispheres)</b>	Inside the skull.
<b>Cerebral cortex</b>	At the outer surface of the two cerebral hemispheres.
<b>Cerebellum</b>	Inside the skull at the back area of the brain below the cerebrum.
<b>Medulla oblongata</b>	Inside the skull below the cerebellum.



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Spinal cord	Inside the backbone.
Gray matter of the cerebrum	At its outer part.
White matter of the cerebrum	At its inner part.
Gray matter of the spinal cord	At its inner part.
White matter of the spinal cord	At its outer part.

## 4. Important numbers and their indications

Number	Its indication
12 pairs	Number of cranial nerves. Number of ribs.
31 pairs	Number of spinal nerves.
33	Number of backbone vertebrae.
10 pairs	Number of the ribs connected to the sternum.

## 5. Give a reason for

- The nervous system has great importance for the human body.
  - Because:
    - It carries nerve messages from one of the areas of the body to another area.
    - It regulates and coordinates all the vital processes within the body.
    - It receives the external stimuli that surround the human being through the sensory organs and identifies and interprets them.
- There are branches called dendrites extending from the neuron's bodies.
  - To connect between the neighboring neurons forming synapse.
- The brain is located inside a bony box called the skull.
  - To protect it.
- The brain is located inside the skull and the spinal cord extends through the inside of the backbone.
  - To be protected from damage.

## Unit 4 Structure and Function of Living Organisms

5. The brain is the main control center in the human body.
  - Because it directs and coordinates all the processes, ideas, behaviors and emotions.
6. The cerebrum is a very important part of the brain.
  - Because:
    - It controls the voluntary movements of the body like running in races.
    - It receives nerve impulses from sense organs (eyes, ears, nose, tongue and skin) and sends responses.
    - It contains the centers of thinking and memory.
7. The cerebellum has great importance for the human body.
  - Because it keeps the body balance during movement.
8. Damage of the medulla oblongata causes death.
  - Medulla oblongata has great importance for the human body.
  - Or Because it is responsible for regulating the involuntary processes of the body such as:
    - Heartbeats.
    - Movement of the respiratory system during breathing.
    - Movement and the function of the digestive system.
9. The spinal cord is located inside the backbone.
  - To protect it.
10. Withdrawal of your hand quickly when you touch a plant with sharp thorns.
  - Or Withdrawal of the hand quickly when it suddenly touches a hot surface.
  - Blinking of the eyelids when an object approaches the eye suddenly.
    - Due to the reflex action made by the spinal cord.
11. It is important not to take sleeping pills without the doctor's prescription.
  - To maintain the nervous system healthy.
12. It is important to reduce the intake of stimulating substances such as tea and coffee.
  - Because they affect sleeping periods and heartbeats and lead to nervous tension.
13. You should avoid sitting for long periods in front of the computer.
  - To not exhaust the sensory organs.



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14. You must stay away from addiction.
  - Because it passively affects the nervous system, as it causes:
    - Retardation of memory and learning.
    - Nervous tension.
    - Sluggishness.
    - Loss of time sensation.
    - Sleeplessness.
15. Movement of man depends on the integration of more than one system.
  - Because movement occurs by participation and integration of the skeletal system, muscular system and nervous system.
16. The skull has great importance for the human body.
  - Because it protects the brain and holds eyes, ears and the nose.
17. The backbone has great importance for the human body.
  - Because it protects the spinal cord and allows the body to bend in different directions.
18. There are cartilages between the vertebrae of the backbone.
  - To prevent friction of vertebrae during movement.
19. The rib cage surrounds the heart and lungs.
  - To protect them.
20. Upper limbs have great importance for the human body.
  - Because they permit eating, drinking, writing and holding things.
21. Lower limbs have great importance for the human body.
  - Because:
    - They permit walking, running, standing and sitting.
    - They carry the rest of the body.
22. Elbow joint is a slightly movable joint.
  - Because it allows for movement in one direction only.
23. Joints between skull bones are immovable joints.
  - Because they do not allow for any movement.
24. Shoulder joint is considered a freely movable joint.
  - Because it allows movement in all directions.



## Unit 4 Structure and Function of Living Organisms

25. Muscles play an important role in human movement.
  - Due to the ability of muscular cells to contract and relax.
26. Presence of tendons at the edge of muscles.
  - To fix the muscles to bones.
27. Face muscles and muscles of limbs are considered voluntary muscles.
  - Because we can move them willingly.
28. We cannot control the muscles of gastrointestinal tract and blood vessels.
  - Because these muscles are involuntary.
29. Muscles of gastrointestinal tract are considered involuntary muscles.
  - Because these muscles work automatically and we cannot control their movements.
30. It is important to eat healthy food rich in calcium, phosphorus and vitamin D.
  - To prevent bone diseases such as osteomalacia and rickets.
31. We should avoid carrying heavy objects that exceed our ability.
  - To protect our skeletal system especially the backbone.
32. It is important to expose our body to sunlight for suitable periods.
  - Because sunlight is important in providing the body with vitamin D.
33. It is important to sit and stand correctly during studying or reading.
  - To avoid straining the neck or the backbone vertebrae.
34. We should avoid jumping from high places.
  - To avoid fractures and sprains.

### 6. What happens in the following cases?

1. The neurons lose their dendrites.
  - The neighboring neurons will not be able to connect with each other.
2. The medulla oblongata is damaged.
  - The involuntary processes such as heartbeats will stop, causing death.
3. The cerebellum is shocked or infected.
  - The body will lose its balance.
4. Approaching something to the eye.
  - This will cause blinking of the eye as a reflex action.



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5. Your hand touches a hot surface.

**Or** Your finger gets pricked by plant thorns.

- This will cause withdrawal of the hand quickly as a reflex action.

6. Over drinking of coffee and tea.

- This will affect sleeping periods and heartbeats and will lead to nervous tension.

7. Sitting for long times in front of the computer.

- The sensory organs will be exhausted affecting passively the nervous system.

8. Continuous exposure to contaminated air from factories' smoke.

- This will passively affect the nervous system.

9. The backbone consists of one bone.

- The body will not be able to bend in different directions.

10. The absence of cartilages between vertebrae of the backbone.

- Friction between vertebrae will occur during their movement causing acute pain.

11. The front arm muscle contracts and the back arm muscle relaxes.

- This will cause bending of the arm.

12. The front arm muscle relaxes and the back arm muscle contracts.

- This will cause extending of the arm.

13. Hip joint has a limited movement.

- The lower limb will not be able to move freely.

14. Jumping from high places or making violent movements.

- This will cause fractures and sprains.

15. Shoulder joints become from slightly movable joints.

- The upper limbs will move in one direction only and will not be able to move freely.

## 7. Comparisons

1.

P.O.C.	Dendrites	Axon terminals
<b>Description</b>	They are branches extending from the neuron's body.	They are nerve endings located at the end of the axon.
<b>Function</b>	They connect between the neighboring neurons.	They are connected to muscles or form a synapse with other neurons.

## Unit 4 Structure and Function of Living Organisms

2.	P.O.C.	Central nervous system	Peripheral nervous system
Structure		<ul style="list-style-type: none"> <li>It consists of the brain and the spinal cord.</li> </ul>	<ul style="list-style-type: none"> <li>It consists of cranial nerves and spinal nerves.</li> </ul>
Function		<ul style="list-style-type: none"> <li>The brain directs and coordinates all the processes, ideas, behaviors and emotions.</li> <li>The spinal cord delivers nerve messages from body organs to the brain and vice versa and is responsible for reflexes.</li> </ul>	<ul style="list-style-type: none"> <li>It delivers sensory information and kinetic responses between the central nervous system and all the body parts.</li> </ul>

3.	P.O.C.	Brain	Spinal cord
Description		It is a nerve block containing millions of nerve cells and it is the main control center in the body.	It is a cylindrical cord from which the spinal nerves extend.
Location		Inside the skull.	Inside the backbone.
Function		It is the main control center in the body as it directs and coordinates all the processes, ideas, behaviors and emotions.	<ul style="list-style-type: none"> <li>It delivers nerve messages from body organs to the brain and vice versa.</li> <li>It is responsible for reflexes.</li> </ul>

4.	P.O.C.	Cranial nerves	Spinal nerves
Description		They are the nerves emerging from the brain.	They are the nerves emerging from the spinal cord.
Number		12 pairs	31 pairs

5.	P.O.C.	Cerebellum	Medulla oblongata
Location		It lies at the back area of the brain below the cerebrum.	It lies above the spinal cord.

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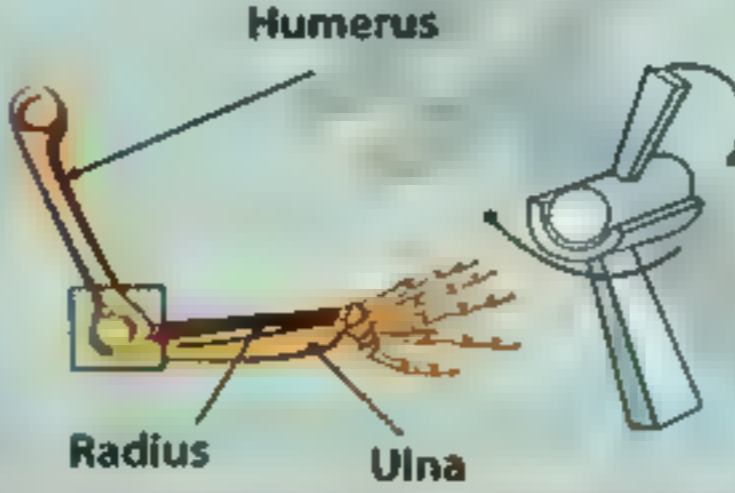
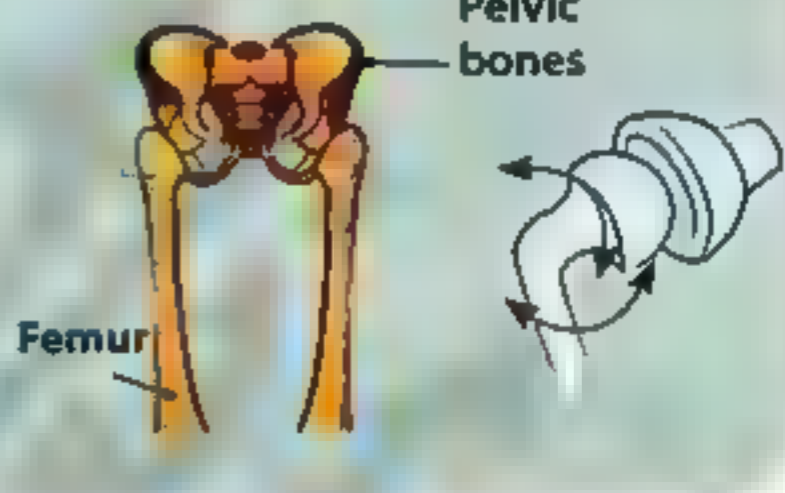
## Function

It keeps the body balance during movement.

It is responsible for regulating the involuntary processes of the body such as:

- Heartbeats.
- Movement of the respiratory system during breathing.
- Movement and the function of the digestive system.

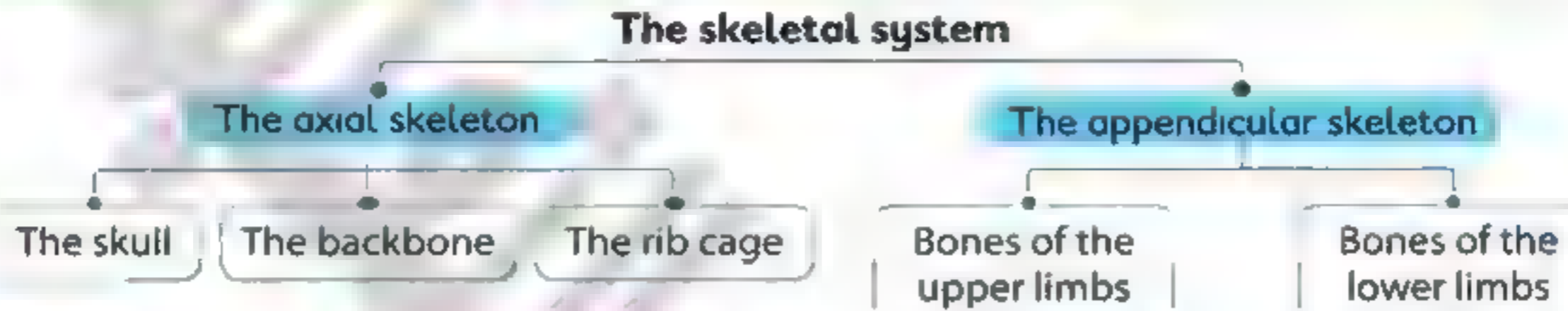
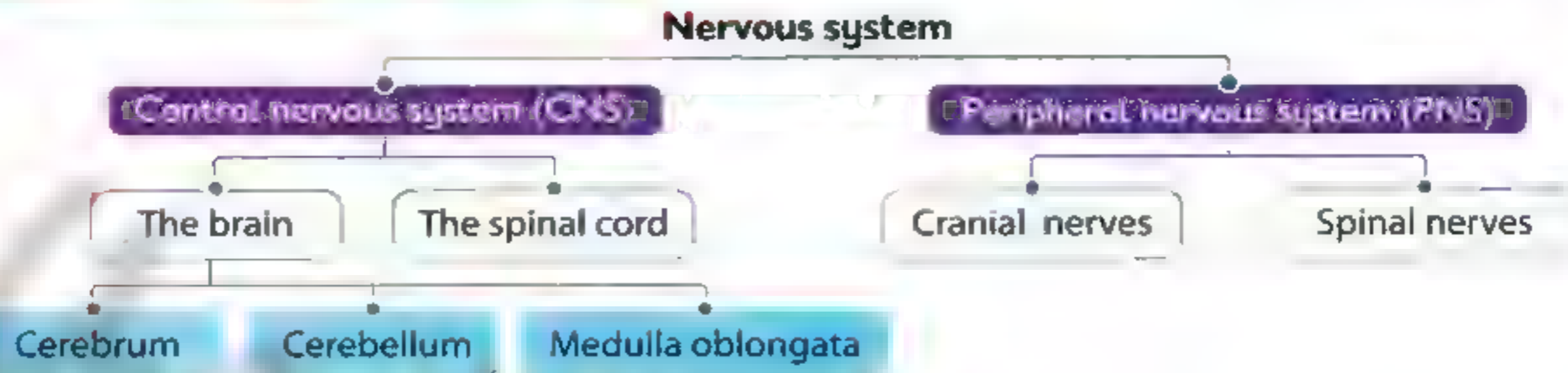
6.

Immovable joints	Slightly movable joints	Freely movable joints
They do not allow any movement.	They allow movement in one direction only.	They allow movement in all directions.
The joints between the bones of the skull.		
<b>Ex.</b> The joints between the bones of the skull.	The knee and elbow joints.	The shoulder, wrist, hip and thigh joints.
 <p>Joints of the skull</p>	 <p>Humerus Radius Ulna</p>	 <p>Pelvic bones Femur</p>

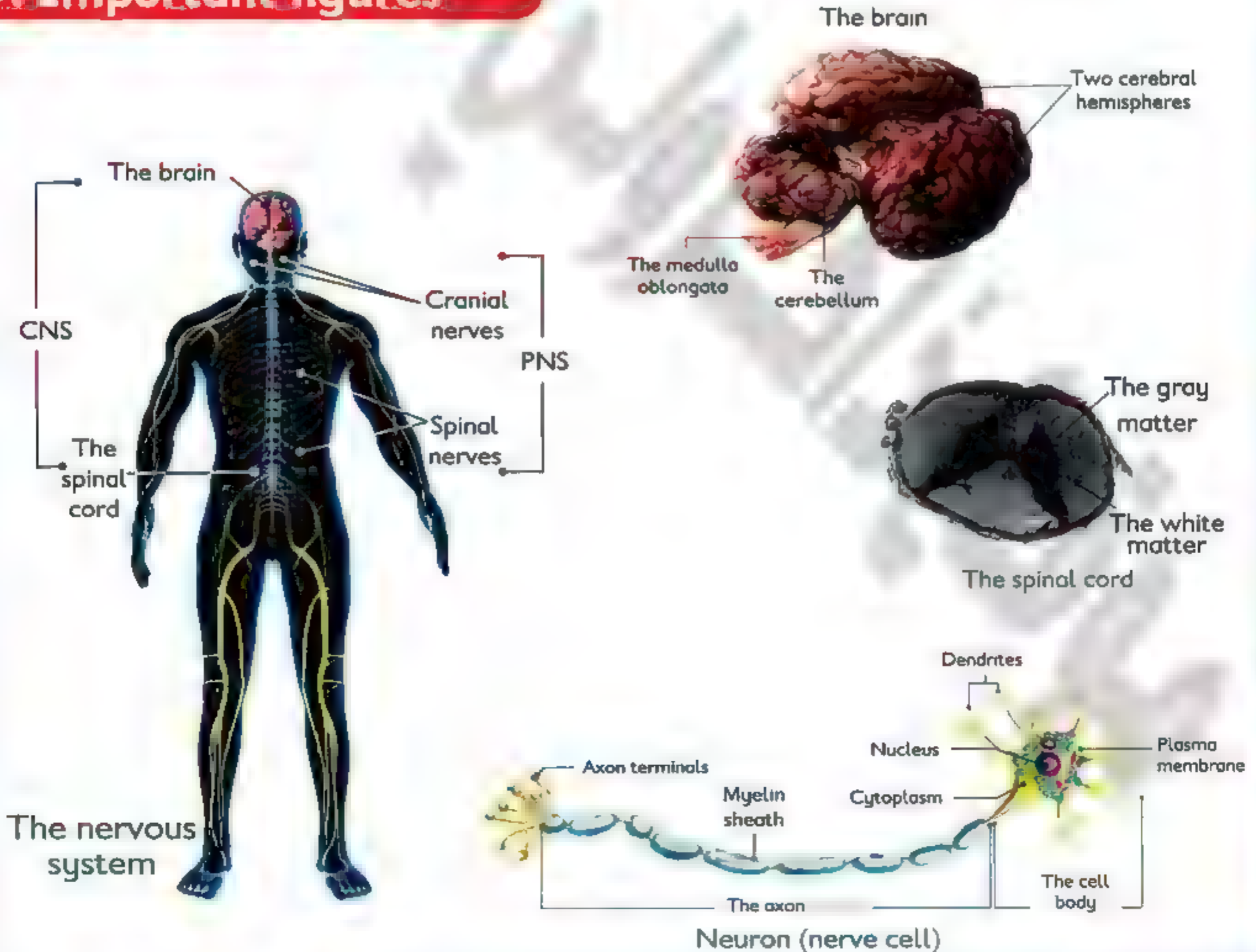
7.

Voluntary muscles	Preparation
They are the muscles that you can move willingly.	They are the muscles that work automatically and you cannot control their movements.
<b>Ex.</b> <ul style="list-style-type: none"> <li>• Limb muscles</li> <li>• Trunk muscles</li> <li>• Face muscles</li> <li>• Abdominal wall muscles</li> </ul>	<ul style="list-style-type: none"> <li>• The gastrointestinal tract muscles</li> <li>• The blood vessels muscles</li> <li>• The bladder muscles</li> <li>• The heart muscle</li> </ul>

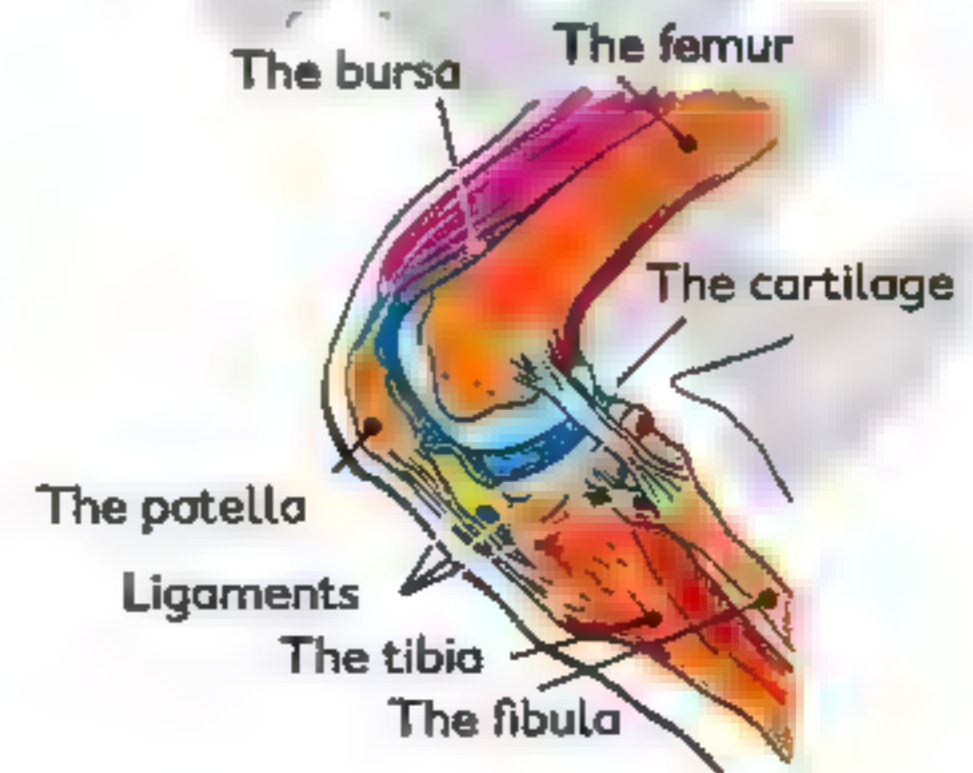
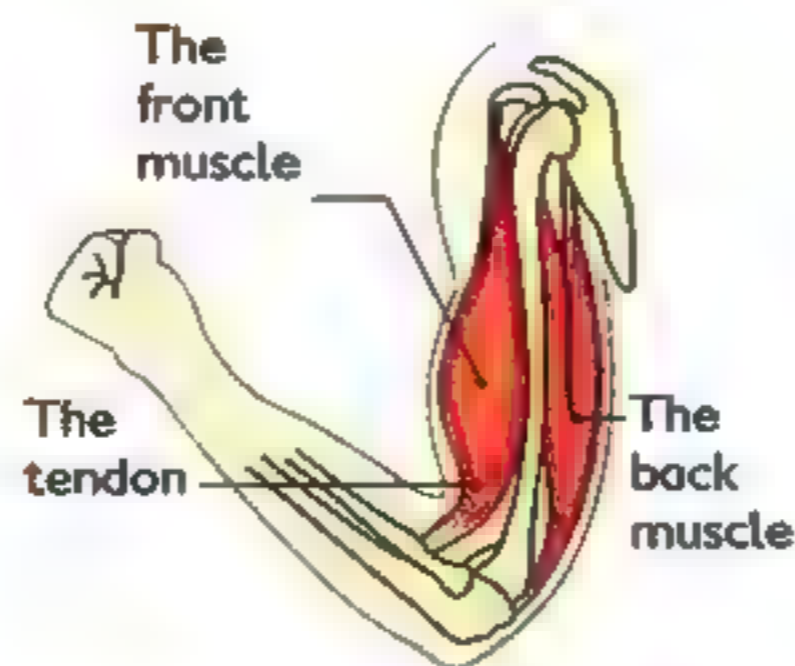
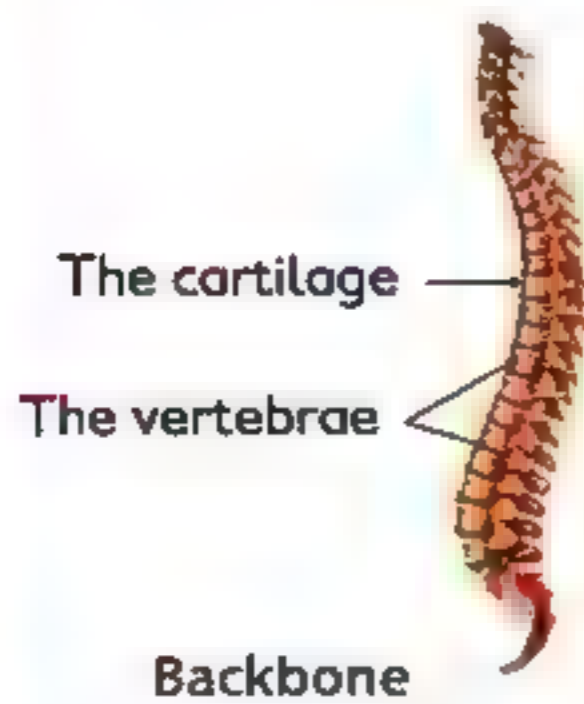
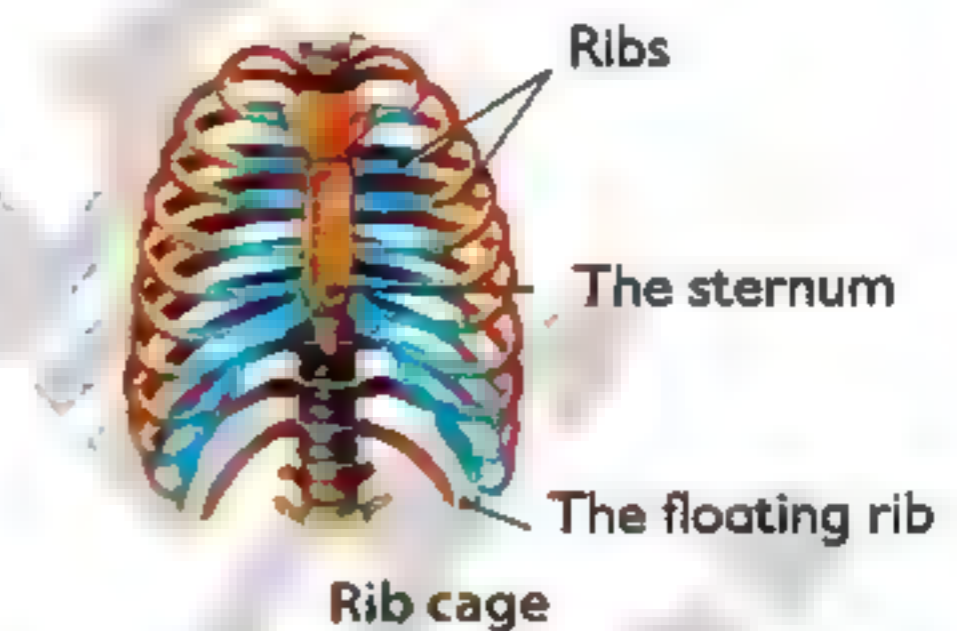
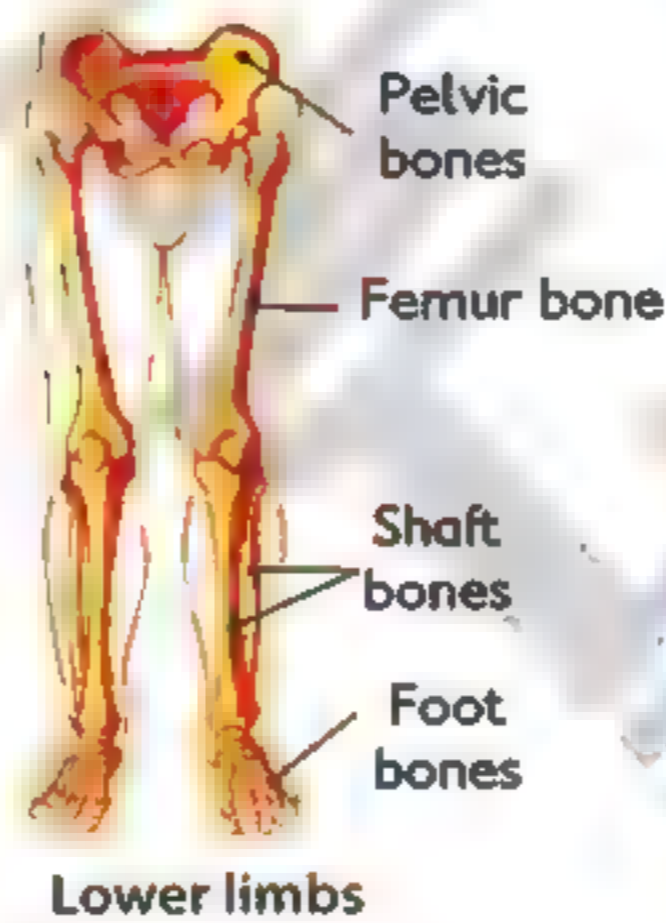
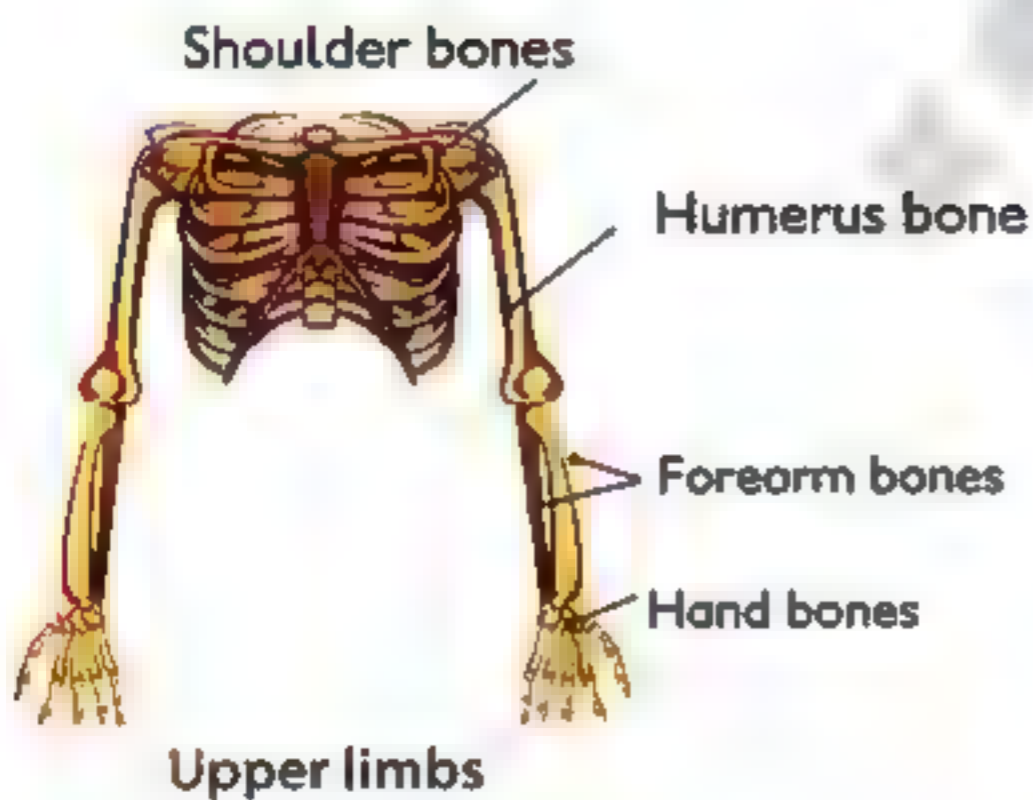
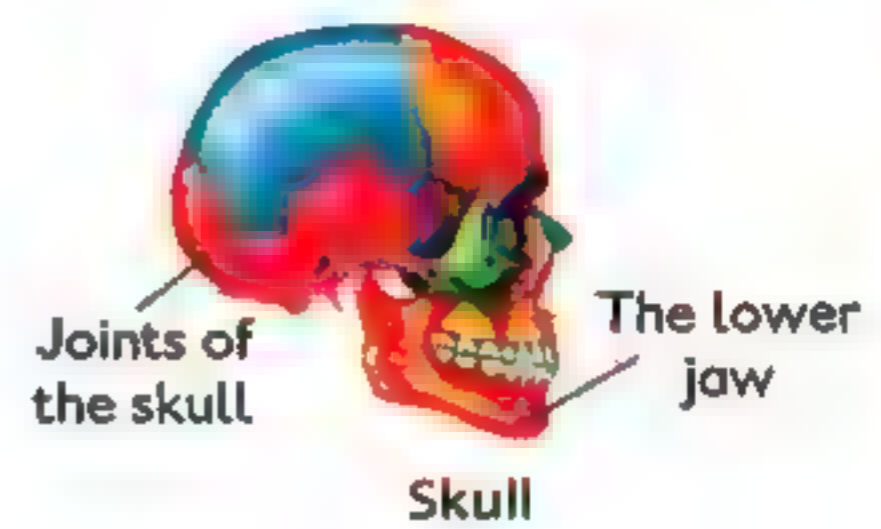
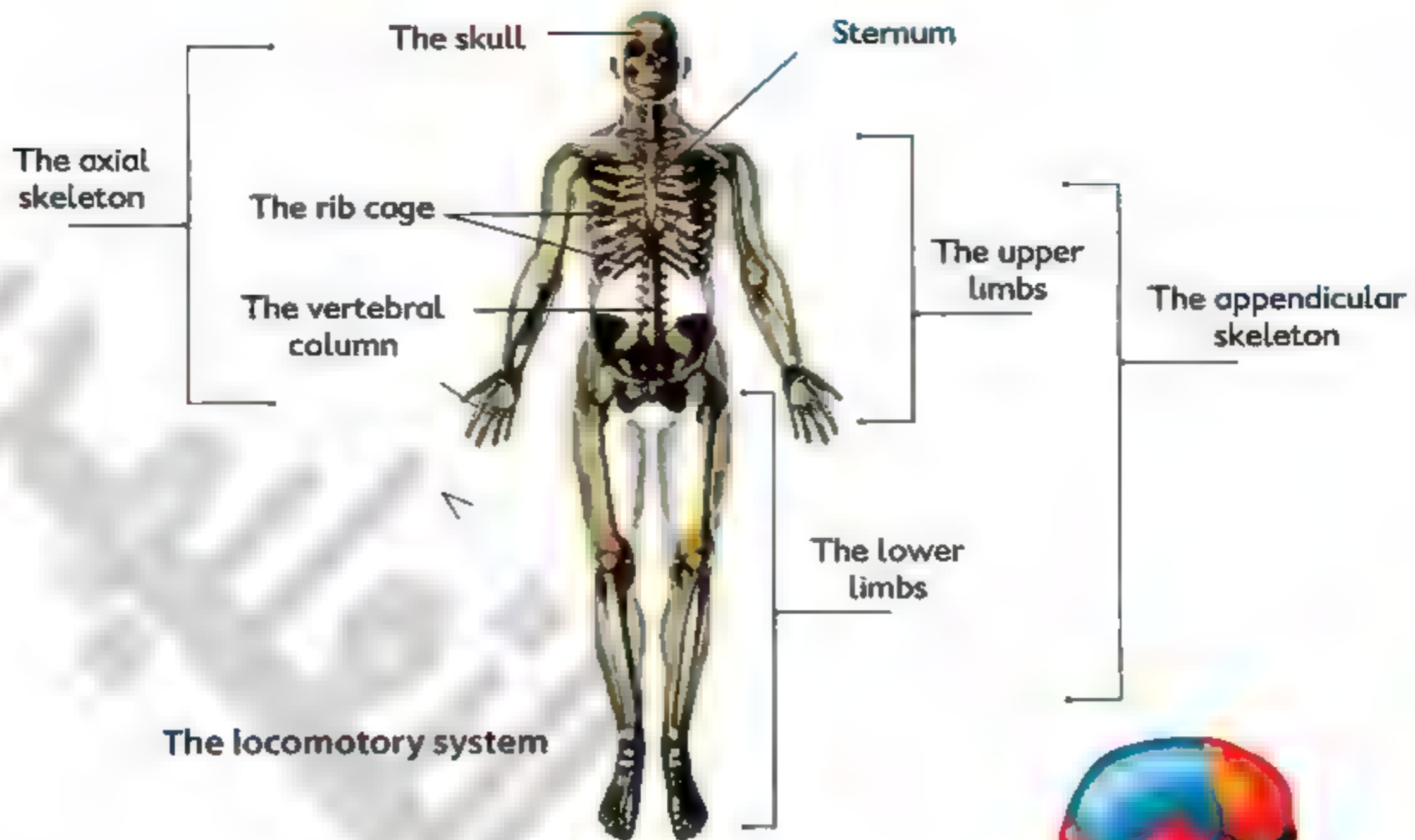
## 8. Important diagrams



## 9. Important figures



## General &amp; Final Revision



## 10. Important points

**Examples of the reflex action:**

1. Withdrawal of the hand quickly on touching a plant with sharp thorns.
2. Withdrawal of the hand quickly on touching a hot surface.
3. Blinking when something gets close to the eye.
4. Constriction of the eye pupil on intense light and its widening on dim light.
5. Trying balance during sliding down.
6. Secreting saliva on seeing or smelling good food.
7. Running quickly on seeing a fast car coming towards you.

**Stages of the reflex action:**

1. The thorns affect the nerve endings in the fingers producing nerve impulses.
2. The nerve impulses are transmitted to the spinal cord through the sensory nerve fiber.
3. The nerve impulses are transmitted from the spinal cord through the motor nerve fiber to the arm muscles.
4. The muscles contract and the arm is pulled away from the thorns.
5. Other nerve impulses are transmitted from the spinal cord to the sensory centers in the brain leading to the true sense of pain.

**Ways of maintaining the human nervous system:**

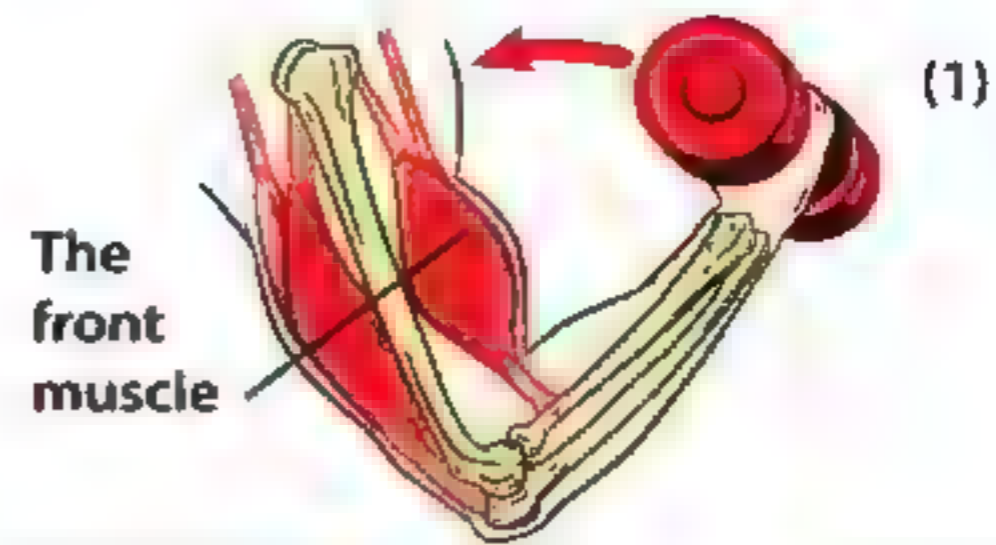
1. Reducing the intake of the stimulating substances such as coffee and tea.
2. Staying away from tranquilizers and stimulants.
3. Avoiding sitting for long periods in front of computers and television.
4. Avoiding the extreme exciting situations.
5. Staying away from sources of pollution (like noisy places and smoke emitted from exhausts of cars, factories, etc.).
6. Giving the body sufficient period of rest especially during sleep.
7. Doing physical exercises.
8. Staying away from addiction.

**Movement is generated by the ability of muscular cells to contract and relax.**

The role of muscles in the movement of the forearm (hand wrist).

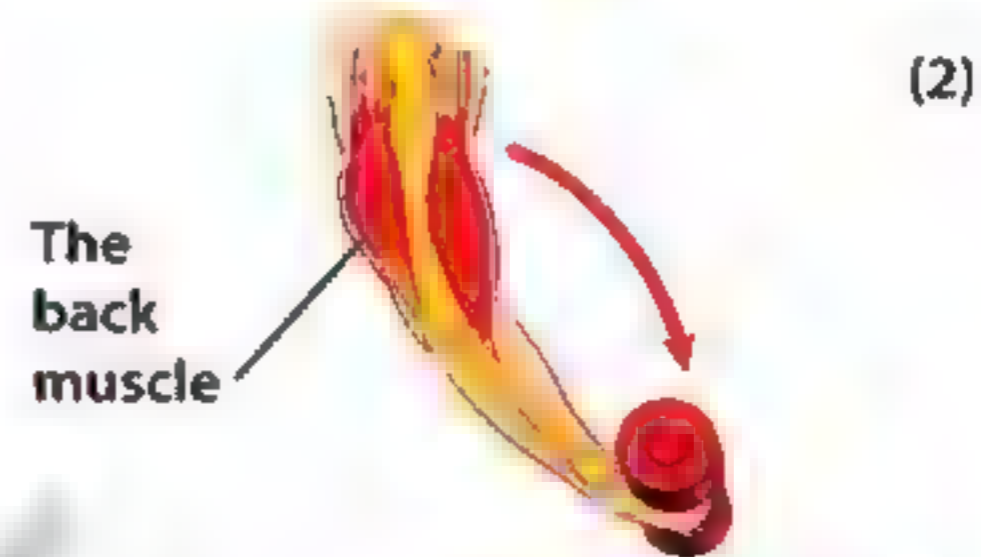
### On bending the arm (1)

- The front muscle contracts, while the back muscle relaxes causing bending of the arm by the help of the elbow joint.



### On extending the arm (2)

- The front muscle relaxes, while the back muscle contracts causing extending of the arm by the help of the elbow joint.



### Ways of maintaining the human locomotory system:

1. Vaccinating children according to Ministry of Health's instructions (ex.: polio vaccine).
2. Eating healthy food rich in calcium, phosphorus and vitamin (D).
3. Avoiding any behavior that leads to fractures and sprains such as jumping from high places and making violent movements.
4. Avoiding carrying heavy things that exceed our ability.
5. Sitting and standing correctly during studying or reading.
6. Exposing your body to sunlight for suitable periods.
7. Exercising regularly.



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part  
(1)

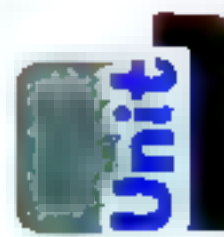
Ongoing Assessment



### ► Contents:

- Worksheets on each Lesson.
- School Book Exercises on each Unit.
- Al-Adwaa General Tests on each Unit.
- "Assess & Reflect" after each unit.

هذا العمل خاص بموقع ذاكرولي التعليمي ولا يسمح بتداوله على مواقع أخرى



# Force and Motion

1

## Mass and Weight

Answer Guide: P. 24

### Worksheet 1

(Total mark)

20

5m

#### 1 (A) Complete the following sentences:

1. The \_\_\_\_\_ is the amount of matter in an object.
2. Mass is measured by different types of scales as \_\_\_\_\_ and \_\_\_\_\_.
3. \_\_\_\_\_ and \_\_\_\_\_ are the measuring units of mass.
4. The mass of an object \_\_\_\_\_ when the amount of matter increases in it.
5. Mass is a constant value and it is not affected by changing \_\_\_\_\_.
6. \_\_\_\_\_ equals the mass of one liter of distilled water at normal temperature.

#### (B) Give a reason for each of the following:

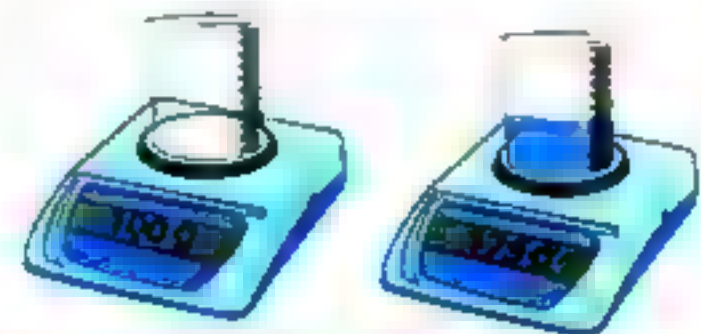
1. The mass of an object on the earth is equal to its mass on the moon.
2. The balance scale should be placed horizontally on a stable shelf.

#### 2 (A) Write the scientific term for each of the following:

5m

1. The measuring unit of mass which is suitable for measuring large masses. (\_\_\_\_\_)
2. The type of scales that is used to measure the mass of small objects as gold and chemicals. (\_\_\_\_\_)
3. The measurement unit of mass which is almost equal to mass of 1000 grams. (\_\_\_\_\_)

#### (B) Calculate the mass of water in the flask shown in the opposite figure.



## Ongoing Assessment &amp; Exams

## 3 (A) Correct the underlined words:

5m

1. The mass of a piece of stone on the earth is smaller than its mass on the moon. ( )
2. Ton is suitable for measuring the mass of jewelry, while gram is suitable for measuring the mass of vegetables. ( )
3. The mass of one liter of distilled water equals 100 grams. ( )
4. Digital scale is used for measuring the weight on objects. ( )

## (B) What is the importance of ...?

1. Sensitive two-arm scale.

2. Balance scale.

## 4 (A) Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

5m

1. The mass of an object is measured in Newton that equals 1000 grams. ( )
2. Kilogram nearly equals the mass of one paper clip. ( )
3. Mass is measured by the spring scale. ( )
4. The mass of a body changes according to its place. ( )

## (B) What is meant by...?

1. The mass of a gold ring is 3 grams.

2. The amount of wood in a chair is 4 kilograms.

(Total mark)

20

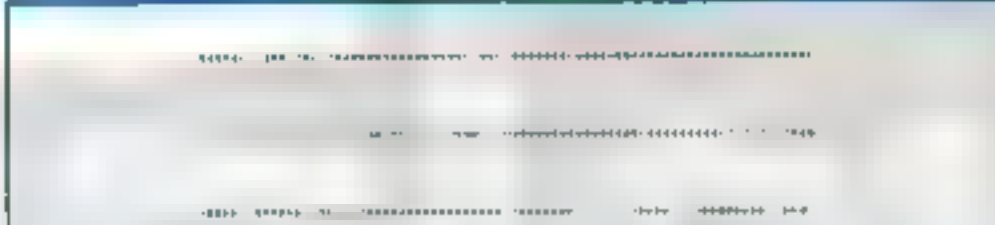
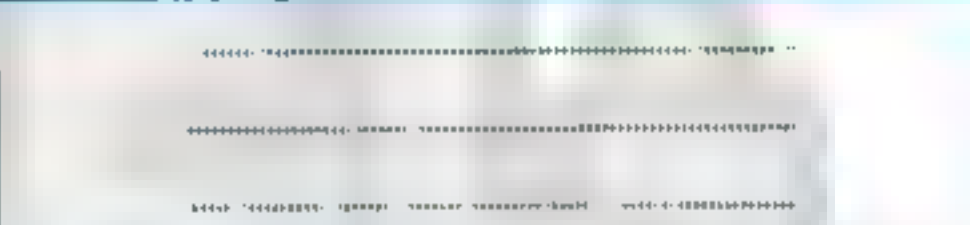
5m

## Worksheet 2

## 1 (A) Choose the correct answer:

- Newton equals the weight of an object whose mass is ..... grams.  
a. 1                      b. 10                      c. 100                      d. 1000
- The weight of any body equals .....  
a. its mass              b. its mass  $\times$  100              c. its mass  $\times$  10              d. its mass/100
- When the mass of a desk is 20 kg, then its weight is .....  
a. 20 N                      b. 200 N                      c. 2 N                      d. 10 N
- The planet on which a body's weight equals 6 times its weight on the moon is .....  
a. Mars                      b. Earth                      c. Jupiter                      d. Mercury

## (B) Compare between the balance scale and the spring scale.

The balance scale	The spring scale
	

## 2 (A) Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

5m

- Gravity in space is zero, that's why astronauts are weightless. ( )
- Newton is the measuring unit of weight. ( )
- When the mass of an object on the earth equals 2 kg, its weight equals 200 N. ( )
- By increasing the mass of a piece of stone, its weight decreases. ( )

## (B) Give a reason for each of the following:

- Astronauts are weightless in space.

- The weight of a body in a balloon is smaller than its weight on earth.

- The weight of an object changes according to the planet that the object exists on.

## Ongoing Assessment &amp; Exams

## 3 (A) Correct the underlined words:

5m

1. The weight of any object can be measured by the balance scale. ( )
2. The mass of a piece of stone on the earth's surface is smaller than its mass on the moon's surface. ( )
3. The effect of the weight is always directed towards the surface of the earth. ( )
4. The reason that objects fall towards the earth is the mass. ( )

## (B) What happens if ...?

1. The mass of an object increases.
2. There is no gravity on the earth's surface.
3. The distance between a person in a balloon and the center of the earth increases.

## 4 (A) Write the scientific term for each of the following:

5m

1. The force by which a body is attracted to the Earth. ( )
2. The measuring unit of weight that is almost equal to the weight of an object whose mass is 100 grams. ( )

## (B) Solve:

1. If the mass of a body is 50 kg on the moon's surface, calculate:
  - a. Its weight on the earth.
  - b. Its weight on the moon.
  - c. Its mass on the earth.
2. The mass of your new motorcycle is 250 grams. Calculate:
  - a. Its weight on the earth (in Newton).
  - b. Its weight on the moon (in Newton).
  - c. The mass of your motorcycle on the moon.

(Total mark)

20

5m

## Worksheet 3

## 1 (A) Complete the following sentences:

- The mass of any matter is \_\_\_\_\_ value and it is not affected by changing \_\_\_\_\_.
- Mass is measured by \_\_\_\_\_ scale, whereas weight is measured by \_\_\_\_\_ scale.
- An object's weight depends on \_\_\_\_\_ and \_\_\_\_\_.
- \_\_\_\_\_ is used to measure very small masses.
- The gravitational force \_\_\_\_\_ as the body moves away from the Earth.

## (B) Solve:

If the weight of your body on the earth's surface is 600 Newton. Calculate:

- your mass on the earth's surface.
- your mass on the moon's surface.
- your weight on the moon's surface.

5m

## 2 (A) Choose the correct answer:

- The mass of half distilled water \_\_\_\_\_ grams.  
a. 5                      b. 50                      c. 500                      d. 5000
- If the weight of an object is 2 N, then its mass is \_\_\_\_\_.  
a. 100 gm              b. 200 gm              c. 300 gm              d. 20 gm
- The weight of any object \_\_\_\_\_ by increasing its mass.  
a. decreases                      b. increases  
c. remains constant              d. no correct answer
- If the mass of an object on the moon = 60 kg, then its weight on the earth = \_\_\_\_\_.  
a. 60 kg                      b. 60 N                      c. 100 N                      d. 600 N

## (B) What happens if ...?

- The mass of an object decreases to half.  
\_\_\_\_\_
- You hang a body in the bottom hook of the spring scale.  
\_\_\_\_\_
- A body of 600 Newton weight is transferred from the earth's surface to the moon's surface.  
\_\_\_\_\_

## Ongoing Assessment &amp; Exams

3 (A) What is the importance of each of the following...?

5m

1. Earth gravity.
2. Balance scale.
3. Spring scale.

(B) A piece of rock is placed in a pan of double-pan balance. If the sum of masses which are placed in the other pan to make balance is 300 gm, complete the following:

1. The mass of the piece of rock is .....
2. The weight of the piece of rock is ...

5m

4 (A) What is meant by ...?

1. The weight of a body on the earth's surface = 400 Newton.
2. The gravitational force by which a body is attracted to the earth = 300 Newton.

(B) Give a reason for each of the following:

1. The weight of a person on the earth's surface is larger than his/her weight on the Moon's surface.
2. The weight of an object is not a fixed value but it differs from one place to another.

# School Book Exercises

on Unit

Answer Guide, P 26

## 1 Choose the correct answer:

- The device that is used for measuring weight is .....
  - one-arm scale
  - two-arm scale
  - digital scale
  - spring scale
- An object whose weight is 20 Newton on the earth, its mass is equal to .....
  - 10 kg
  - 2 kg
  - 200 kg
  - 20 kg

## 2 Complete the following sentences:

- Mass is measured by ..... , whereas weight is measured by .....
- Mass is the amount of matter that a body contains. It does not change according to .....
- An object's weight depends on ..... and .....

## 3 Fill in the following table:

Points of comparison	Mass	Weight
Definition	.....	.....
Units of measurement	.....	.....
Devices of measurement	.....	.....
Direction	.....	.....
The effect of changing places	.....	.....

## Ongoing Assessment &amp; Exams

4 If an object's mass = 30 kg on the earth, calculate:

1. Its mass on the moon.

---

---

---

2. Its weight on the earth.

---

---

---

3. Its weight on the moon.

---

---

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# Al-Adwaa

## General Tests on Unit

1

Answer Guide: P. 26

(Total mark)

20

5m

### Test 1

#### 1 (A) Write the scientific term for each of the following:

1. The device that is used for measuring the mass of an object.

(.....)

2. The amount of matter in an object.

(.....)

3. The force by which a body is attracted to the earth.

(.....)

4. The measurement unit of mass which is almost equal to the mass of 1 liter of distilled water.

(.....)

5. The measuring device of weight.

(.....)

#### (B) Compare between kilogram and Newton.

Points of comparison	Kilogram	Newton
Definition	.....	.....

#### 2 (A) Complete the following sentences:

5m

1. The weight of an object on the moon's surface is equal to ..... its weight on the earth's surface.

2. .... is suitable for measuring small masses, while ..... is suitable for measuring large masses.

3. .... and .... are from the types of the two-arm scales.

4. The effect of weight is always directed towards .....

#### (B) What happens if ... ?

1. The mass of a planet where objects exist increases.

2. The distance between a person in a balloon and the center of the earth increases.

3. A body moves away from the center of the earth with regard to its mass.

## Ongoing Assessment &amp; Exams

## 3 (A) Correct the underlined words:

5m

1. The mass of your body on the earth is more than that on the moon. ( )
2. The measurement unit of weight is the gram. ( )
3. The grocer's scale is a spring scale. ( )
4. The weight is inversely proportional to the mass. ( )
5. The mass of a body depends on its distance from the earth's surface. ( )

(B) If the weight of an object on the moon's surface is 60 N, calculate the mass and weight of this object on the earth.

## 4 (A) Choose the correct answer:

5m

1. \_\_\_\_\_ equals the mass of one paper clip.  
a. Gram      b. Newton      c. Kilogram      d. Liter
2. If your weight on the moon's surface is 50 N, then your weight on the earth's surface is \_\_\_\_\_.  
a. 300 N      b. 50 N      c. 30 N      d. 500 N
3. The acceleration of gravity of the earth (g) equals \_\_\_\_\_.  
a. 100 m/s<sup>2</sup>      b. 10 m/s<sup>2</sup>      c. 5 m/s<sup>2</sup>      d. 50 m/s<sup>2</sup>
4. By increasing the distance between a person and the earth \_\_\_\_\_  
a. the weight of the person increases  
b. the gravitational force for this person decreases  
c. the weight of the person decreases      d. (b) and (c)

(B) What is meant by ...?

1. Mass.

2. Weight.

(Total mark)

20

## Test 2

5m

## 1 (A) Complete the following sentences:

1. The object whose mass is 300 grams on the earth's surface its weight equals \_\_\_\_\_.
2. Mass is measured by \_\_\_\_\_, whereas weight is measured by \_\_\_\_\_.
3. An object's weight depends on \_\_\_\_\_ and \_\_\_\_\_.
4. The weight of any object on the \_\_\_\_\_ planet equals 6 times its weight on the moon.

## (B) Give a reason for each of the following:

1. The weight of an object is affected by its mass.  
\_\_\_\_\_
2. The mass of an apple is not equal to its weight.  
\_\_\_\_\_
3. The moon's gravity is less than the earth's gravity.  
\_\_\_\_\_

5m

## 2 (A) Write the scientific term for each of the following:

1. The device that is used to measure the mass of the chemical substances in the lab. (\_\_\_\_\_)
2. Weight/10. (\_\_\_\_\_)
3. The measurement unit of mass which is almost equal to a liter of distilled water. (\_\_\_\_\_)
4. The device that is used for measuring weight. (\_\_\_\_\_)
5. The device that is used for measuring mass. (\_\_\_\_\_)
6. The unit that is used for measuring weight. (\_\_\_\_\_)

## (B) What happens in the following cases?

1. The mass of an object decreases.  
\_\_\_\_\_
2. There is no gravity on the earth's surface.  
\_\_\_\_\_

## Ongoing Assessment &amp; Exams

## 3 (A) Correct the underlined words:

5m

1. The extension of the wire of spring scale equals the mass of the object hung on it. (.....)
2. The object's mass on the moon is six times its mass on the Earth. (.....)
3. When the distance between an object and the center of its planet increases its weight increases. (.....)
4. The reason that objects fall towards the Earth is the mass. (.....)

## (B) If an object's mass is 80 kg, calculate:

1. Its weight on the earth.

2. Its mass on the moon.

3. Its weight on the moon.

## 4 (A) Choose the correct answer:

5m

1. The mass of a liter of water is equal to .....  
a. 5 g                      b. 50 g                      c. 1000 g                      d. 5000 g
2. The measurement tool of mass is .....  
a. kilogram                      b. Newton                      c. spring balance                      d. balance scale
3. If the mass of a body on the moon is 20 kg, then its mass on the earth is .....  
a. 20 kg                      b. 10 N                      c. 60 kg                      d. 60 N
4. Newton is equal to the weight of a body whose mass is .....  
a. 1 g                      b. 10 g                      c. 100 g                      d. 1000 g

## (B) Compare between mass and weight:

Points of comparison	Mass	Weight
1. Units of measurement	.....	.....
2. Devices of measurement	.....	.....
3. Direction	.....	.....
4. The effect of changing place	.....	.....
5. Definitions	.....	.....

# Unit 2 Thermal Energy

Lesson 1

## Heat Conduction

Answer Guide: P. 27

### Worksheet 4

(Total mark)

20

5m

#### 1 (A) Complete the following sentences:

- Heat transfers from the \_\_\_\_\_ temperature object to the \_\_\_\_\_ temperature object.
- \_\_\_\_\_ is the degree of hotness or coldness of a body.
- Heat is a form of \_\_\_\_\_ and can be measured by using \_\_\_\_\_.
- Wood is a \_\_\_\_\_ conductor of heat, while iron is a \_\_\_\_\_ conductor of heat.
- Heat is important for many industries such as \_\_\_\_\_ and \_\_\_\_\_.

#### (B) Put (✓) or (X):

- All materials are good conductors of heat.
- Copper is a good conductor of heat.
- Iron conducts heat faster than aluminum.

( )  
( )  
( )

#### 2 (A) Write the scientific term for each of the following:

- Materials that don't allow heat to flow through.
- An indicator that helps us to express the state of a body from the point of hotness and coldness.
- Materials that are used in making kettles and cooking pots.
- An insulating material left between the two glass sheets of insulating glass windows.

( )  
( )  
( )  
( )

#### (B) What happens if ...?

- Two bodies have the same temperature touch each other.
- Handles of cooking pots are made of aluminum.
- All substances that man uses are good conductors of heat.

## Ongoing Assessment &amp; Exams

## 3 (A) Choose the correct answer:

5m

- When you touch a cup of hot tea, .....  
 a. heat transfers from the hand to the cup  
 b. heat transfers from the cup to the hand  
 c. heat does not transfer from or to the hand  
 d. no correct answer
- Temperature is measured by using a device called .....  
 a. barometer      b. thermometer      c. voltmeter      d. ammeter
- Scientists classify the materials into .....  
 a. heat insulators only      b. heat conductors only  
 c. (a) and (b)      d. heat conductors and metals
- All the following are bad conductors of heat except .....  
 a. aluminum and iron      b. glass and wool  
 c. rubber and air      d. wood and plastic

## (B) Give a reason for each of the following:

- Heat has great importance in industry.
- Glass is a heat insulator, while copper is a heat conductor.
- Copper differs from iron and aluminum in conducting heat.

## 4 (A) Compare between heat conductors and heat insulators:

5m

Points of comparison	Heat conductors	Heat insulators
1. Definition	.....	.....
2. Examples	.....	.....
3. Uses	.....	.....

## (B) What is meant by ...?

- Heat.
- Thermometer.

## Worksheet 5

(Total mark)

20

5m

## 1 (A) Complete the following sentences:

- \_\_\_\_\_ conducts heat faster than aluminum.
- Handles of cooking utensils and kettles are made of \_\_\_\_\_ or \_\_\_\_\_.
- \_\_\_\_\_ is used in making heavy blankets and \_\_\_\_\_ that keep the body warm.
- To avoid train accidents, \_\_\_\_\_ are left between railway bars.

## (B) Correct the underlined words:

- Copper, iron and air allow heat to transfer through them. (\_\_\_\_\_)
- Iron is the fastest metal in conducting heat. (\_\_\_\_\_)
- Different metals transfer heat with the some rate. (\_\_\_\_\_)

5m

## 2 (A) What happens if ...?

- No gaps are left between railway bars.
- You hold a cube of ice with your hand.

## (B) Write the importance of...:

- Aluminum and stainless steel.
- Wood and plastic.
- Heat energy.

5m

## 3 (A) Give a reason for each of the following:

- Plastic is considered a bad conductor of heat.
- Cooking pots are made of aluminum or stainless steel.
- It is necessary to wear heavy woolen clothes in winter.

## Ongoing Assessment &amp; Exams

(B) Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

1. Heat is the degree of hotness or coldness of a body. ( )
2. Heat transfers from cold objects to hot objects. ( )
3. Air is a heat insulator. ( )
4. Wool and heavy blankets are used to keep the body warm because they are heat conductors. ( )

4 (A) Define each of the following:

5m

1. Heat conductors.
2. Temperature.

(B) Choose from column (A) what suits in column (B):

(A)	(B)
1. Aluminum	a. is used in making handles of kettles.
2. Wood	b. is used in making cooking pots.
3. Wool	c. keeps the body warm in winter.

- 1.
- 2.
- 3.

(C) Write the scientific term for each of the following:

1. The device that is used in measuring temperature. ( )
2. Materials that do not let heat flow through. ( )
3. A type of clothes used in winter to keep the body warm. ( )
4. The form of energy that transfers from an object of high temperature to another object of low temperature. ( )

2

## Measuring Temperature

Answer Guide: P. 28

## Worksheet 6

(Total mark)

20

5m

## 1 (A) Complete the following sentences:

1. The liquid metal that is used in thermometer is .....
2. .... and ..... are two kinds of thermometers.
3. We can use the ..... thermometer to measure the temperature of human being.
4. The main idea of thermometers' working is changing the ..... of liquid as the ..... changes.
5. We cannot depend on the sense of ..... to determine the temperature of our bodies.

## (B) Choose the correct answer:

1. The bulb of the medical thermometer is filled with .....  
a. alcohol      b. water      c. mercury      d. air
2. The medical thermometer is characterized than Celsius thermometer by the presence of .....  
a. constriction      b. mercury bulb      c. capillary tube      d. scale
3. When the temperature of mercury increases, its ..... regularly.  
a. volume decreases      b. volume increases  
c. mass increases      d. (b) and (c)
4. The temperature of liquid is measured by using .....  
a. thermostat      b. medical thermometer  
c. Celsius thermometer      d. no correct answer

## 2 (A) Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

5m

1. Mercury is a good conductor of heat. ( )
2. Each degree in the medical thermometer is divided into 3 parts. ( )
3. The normal temperature of the healthy person is 35°C. ( )

## (B) What happens if ...?

1. There is no constriction in the medical thermometer.
2. The clinical thermometer is put in boiling water.

## Ongoing Assessment &amp; Exams

3 (A) Write the scientific term for each of the following:

5m

1. The part of medical thermometer that prevents mercury from going back to the bulb. (.....)
2. The part of the medical thermometer that is filled with mercury. (.....)
3. The liquid that is used to sterilize the medical thermometer. (.....)

(B) Give a reason for each of the following:

1. Mercury is used in making thermometer.
2. There is a constriction above the mercury bulb in the medical thermometer.

4 (A) Choose from column (A) what suits in column (B):

5m

(A)	(B)
1. Constriction	a. expands regularly by heating.
2. Glass bulb	b. kills microbes on the surface of the medical thermometer.
3. The mercury	c. prevents mercury from going back to the bulb easily.
4. Ethyl alcohol	d. is found in the medical thermometer and the Celsius thermometer.
5. Celsius	e. is the measuring unit of temperature.

1. ....
2. ....
3. ....
4. ....
5. ....

(B) Correct the underlined words:

1. Liquids expand by cooling. (.....)
2. One of mercury properties is that it gives a narrow range to temperature measurements. (.....)
3. The graduation of the Celsius thermometers ranges from 32 °C to 100 °C. (.....)
4. The melting point of ice is 100 °C. (.....)

## 20

5m

## 5m

[illegible]

## Ongoing Assessment &amp; Exams

(B) Write the scientific term for each of the following:

1. A modern device used to measure the body's temperature especially for children. (.....)
2. The boiling point of water. (.....)
3. The type of thermometers graduated from 35°C to 42°C. (.....)

3 (A) Give a reason for each of the following:

5m

1. Do not seize the thermometer firmly with your teeth.
2. We cannot use the clinical thermometer in measuring the temperature of boiling water.
3. The thermometer must be kept out of reach of children.

(B) What happens if ...?

1. You use the medical thermometer without sterilizing it.
2. You use the medical thermometer without shaking it.
3. Mercury is replaced by water in making thermometers.

4 (A) Compare between the medical thermometer and the Celsius thermometer:

5m

Points of comparison	Medical thermometer	Celsius thermometer
1. Usage	.....	.....
2. Scale	.....	.....
3. Used liquid	.....	.....
4. Constriction	.....	.....

(B) Write the importance (use) of ...:

1. Mercury in thermometers.
2. Ethyl alcohol.

# School BOOK Exercises

## Unit 2

Answer Guide P 29

### 1 Complete the following sentences:

- We measure temperature by using .....
- ..... is used in measuring temperatures of different liquids, whereas ..... is used in measuring the temperature of the human body.
- ..... and ..... are good conductors of heat.
- ..... and ..... are bad conductors of heat.

### 2 Write the scientific term for each of the following statements:

- The device that is used for measuring temperature. (.....)
- The materials that allow heat to flow through. (.....)
- The materials that do not allow heat to flow through. (.....)

### 3 Write the most important uses of the good and bad conductors of heat:

P.O.C.	Good conductors of heat	Bad conductors of heat
Uses	.....	.....

### 4 Fill the spaces in the following tables:

a) **Points of comparison**      **Medical thermometer**      **Celsius thermometer**

Usage	.....	.....
Structure	.....	.....
Used liquid	.....	.....
Scale	.....	.....

## Ongoing Assessment &amp; Exams

b) Points of comparison      Good conductors of heat      Bad conductors of heat

Definition		
Usage		
Examples		

5 Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

1. Medical thermometer is used in measuring the temperatures of different liquids. ( )
2. The scale of the Celsius thermometer starts from 35°C to 42°C. ( )
3. Aluminum is a bad conductor of heat. ( )
4. Wood is a good conductor of heat. ( )

6 Write an explanation for each of the following:

1. Mercury is used in thermometers.
2. The handles of cooking utensils are made of wood or plastic.
3. Cooking utensils are made of stainless steel or aluminum.
4. There is a constriction in the medical thermometer.

# ? Al-Adwaa

## General Tests on Unit

2

Answer Guide: P. 30

### Test 1

(Total mark)

20

5m

#### 1 (A) Complete the following sentences:

1. Temperature is considered as an indicator that helps us to express ... and ... of the body.
2. ... is a form of energy that transfers from a hot object to a cold object.
3. The scale of the medical thermometer starts from ... and ends at ...
4. Each degree in the scale of the medical thermometer is divided into ... parts.
5. Mercury is ... metal which is a ... conductor of heat.

#### (B) What is the main idea of making the thermometers?

#### 2 (A) Choose the correct answer:

5m

1. Temperature of the human body is measured by the ...
  - a. Celsius thermometer
  - b. clinical thermometer
  - c. thermostat
  - d. (a) and (b)
2. The clinical thermometer is characterized from the Celsius thermometer by the presence of ...
  - a. capillary tube
  - b. glass bulb
  - c. constriction
  - d. (a) and (b)
3. When you touch a cube of ice, heat transfers from ...
  - a. hand to ice
  - b. ice to hand
  - c. air to ice
  - d. ice to air
4. All the following are bad conductors of heat except ...
  - a. aluminum and iron
  - b. glass and wool
  - c. paper and air
  - d. rubber and plastic
5. Aluminum conducts heat faster than ...
  - a. copper
  - b. iron
  - c. glass
  - d. (a) and (b)
6. The insulating glass windows are made up of ...
  - a. two adhesive sheets of glass
  - b. two sheets of glass with a space containing air in between
  - c. a thin glass sheet
  - d. a thin glass sheet containing water

## Ongoing Assessment &amp; Exams

(B) Give a reason for each of the following:

1. Gaps are left between railway bars.
2. The medical thermometer must be sterilized before using.

3 (A) Write the scientific term for each of the following:

1. A type of thermometers graduated from  $35^{\circ}\text{C}$  to  $42^{\circ}\text{C}$ .
2. The lower point of the Celsius thermometer that represents the melting point of ice.
3. The liquid that is used in making thermometers.
4. The best metal in conducting heat.

5m

( )

( )

( )

( )

(B) Write the importance of ...:

1. Thermometers.
2. Ethyl alcohol.

4 (A) Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

1. We cannot depend on the sense of touching to measure the temperature of patients.
2. The scale of Celsius thermometer starts from  $0^{\circ}\text{C}$  to  $100^{\circ}\text{C}$ .
3. The normal temperature of a healthy person is  $39^{\circ}\text{C}$ .
4. Heat conductors allow heat to flow through them.

5m

( )

( )

( )

( )

(B) What happens if ...?

1. Handles of cooking pots are made of aluminum.
2. There is no constriction in the medical thermometer.

(Total mark)

20

## Test 2

5m

## 1 (A) Choose the correct answer:

- The liquid that is used in the manufacturing of thermometers is .....  
a. bromine      b. colored water      c. mercury      d. no correct answer
- The lower point of the Celsius thermometer is ..... and it represents the melting point of ice.  
a.  $100^{\circ}\text{C}$       b.  $50^{\circ}\text{C}$       c.  $0^{\circ}\text{C}$       d.  $37^{\circ}\text{C}$
- ..... is one of the examples of heat conductors.  
a. Wood      b. Glass      c. Iron      d. Wool
- To prevent the leakage of heat, insulating glass windows contain a layer of .....  
a. air      b. water      c. oil      d. no correct answer
- The thermometer whose scale ranges from  $0^{\circ}\text{C}$  to  $100^{\circ}\text{C}$  is .....  
a. the medical thermometer      b. the Celsius thermometer  
c. (a) and (b)      d. no correct answer

## (B) Write the scientific term for each of the following sentences:

- The form of energy that transfers from a hot body to a cold one. (.....)
- The device that is used to measure the temperature of the human body. (.....)
- The part of the medical thermometer that prevents mercury from returning to the bulb easily. (.....)
- Materials that do not let heat flow through. (.....)

## 2 (A) Choose from column (A) what suits in column (B):

5m

(A)	(B)
1. Heat	a. is an indicator for the degree of hotness or coldness.
2. Ethyl alcohol	b. is the form of energy that transfers from an object of high temperature to an object of low temperature.
3. Temperature	c. is used in making of handles of kettles.
4. Wood	d. is used to sterilize the clinical thermometer.

1. ....
2. ....
3. ....
4. ....

## Ongoing Assessment &amp; Exams

(B) Give a reason for each of the following:

1. There is a constriction above the mercury bulb in the medical thermometer.
2. The thermometer must be kept out of reach of children.
3. Mercury gives a wide range to measure the temperature.

3 (A) Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

1. Wool and heavy blankets are used to keep the body warm because they are heat conductors. ( )
2. We cannot depend on the sense of touching to measure the temperature of patients. ( )
3. Before using the medical thermometer, we must sterilize it using water. ( )
4. All materials are good conductors of heat. ( )

(B) Look at the opposite figure, then answer:

1. This figure represents .....
2. Label the figure:
  1. ....
  2. ....
  3. ....
  4. ....
3. This device is used in .....



4 (A) Correct the underlined words:

1. Celsius thermometers are used in measuring the temperature of the human body. ( )
2. The degrees of heat conduction of all metals are the same. ( )
3. Cooking pots are made of plastic or wood. ( )
4. Mercury contracts regularly by heating. ( )
5. The normal temperature of the healthy person is 35°C. ( )

(B) Why is mercury preferred in making thermometers?

# Unit 3 The Atmosphere

Lesson 1

Oxygen

Answer Guide: P. 31

## Worksheet 8

(Total mark)

20

5m

## 1 (A) Complete the following sentences:

- ..... are the main sources of the oxygen gas on the Earth's surface.
- Oxygen gas molecule consists of ..... atom(s).
- The gas that represents 78% of air is ....., while ..... represents 21%.
- Oxygen is produced in the laboratory by decomposition of .....

## (B) Give a reason for each of the following:

- Although oxygen is consumed during respiration, its percentage remains stable in the atmosphere.
- Oxygen is collected by downward displacement of water.
- Manganese dioxide is added to hydrogen peroxide during oxygen preparation.

## 2 (A) Write the scientific term for each of the following:

5m

- A mixture of different gases surrounding the earth's surface and attracted to it by gravity. (.....)
- The catalyst that is used in oxygen preparation. (.....)
- The gas that represents one fifth of the volume of atmosphere. (.....)
- The process in which green plants take oxygen and produce carbon dioxide. (.....)

## (B) Correct the underlined words:

- The decrease in the oxygen percentage is compensated through the combustion process. (.....)
- Hydrogen peroxide dissociates in the presence of a catalyst into nitrogen and oxygen. (.....)
- Oxygen is prepared by upward displacement of water. (.....)

## Ongoing Assessment &amp; Exams

## 3 (A) Choose the correct answer:

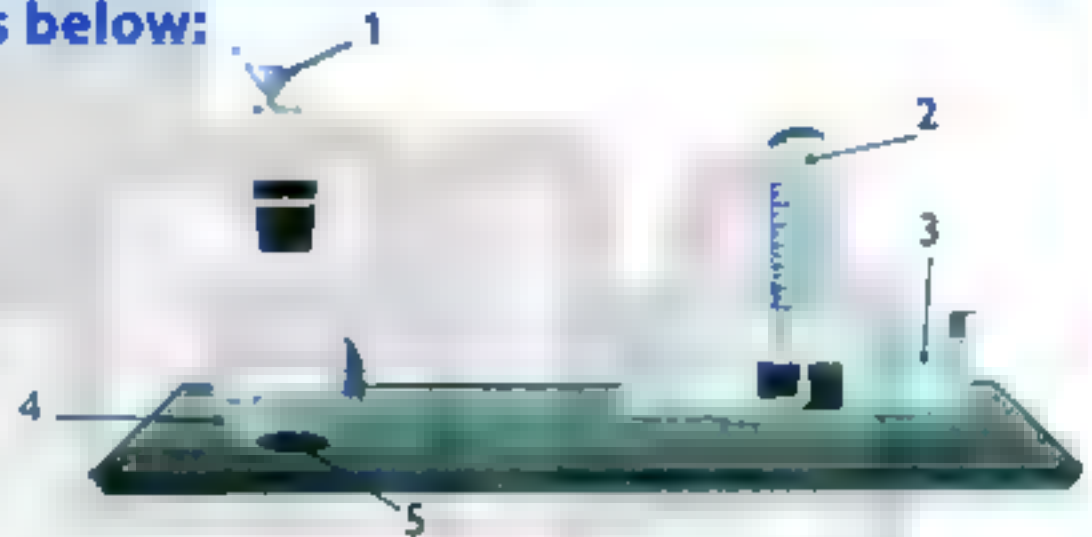
5m

- Which of the following gases has a great percentage in the atmospheric air? –  
a. Oxygen      b. Carbon dioxide      c. Ozone      d. Nitrogen
- The gas that forms 0.03% of air is  
a. nitrogen      b. oxygen      c. carbon dioxide      d. ozone
- Photosynthesis process requires the presence of  
a. carbon dioxide gas      b. light energy  
c. water and minerals      d. all the previous answers
- The chemical formula of oxygen molecule is  
a. O      b. O<sub>2</sub>      c. O<sub>3</sub>      d. O<sub>4</sub>

## (B) Look at the opposite apparatus that is used in the preparation of oxygen in the lab, then answer the questions below:

## 1. Write the labels:

- 1.
- 2.
- 3.
- 4.
- 5.



- Write the function of no.5 and describe what happens to it at the end of the reaction.
- How is oxygen collected? Why?

5m

## 4 (A) Define each of the following:

- Photosynthesis process:
- Catalyst:

## (B) What happens if ...?

- There is no atmosphere.
- The percentage of oxygen decreases in air.
- We don't use manganese dioxide in the preparation of oxygen gas.

(Total mark)

20

## Worksheet 9

1 (A) Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

5m

1. Oxygen gas is colorless, odorless and does not help in burning. ( )
2. Oxygen gas is heavier than air. ( )
3. The mass of a material decreases after combination with oxygen. ( )
4. Oxygen gas reacts with the burning magnesium forming a black powder. ( )
5. The ozone layer protects the earth from harmful radiations that come from the sun. ( )

(B) Mention the role of manganese dioxide in the preparation of oxygen:

2 (A) Give a reason for each of the following:

5m

1. Oxyacetylene flame is used in melting and cutting metals.
2. Oxygen cylinders are used during climbing mountains.

(B) Choose from column (A) what suits in column (B):

(A)	(B)
1. Catalyst	a. consists of 2 hydrogen atoms and 1 oxygen atom.
2. Ozone	b. is a white powder.
3. Magnesium oxide	c. helps hydrogen peroxide to decompose quickly.
4. Water molecule	d. protects the earth from the danger of harmful radiations.

1. ....
2. ....
3. ....
4. ....

3 (A) Correct the underlined words:

5m

1. Oxygen is used in the composition of the ammonia gas that protects the Earth. ( )
2. Oxyacetylene flame is produced by burning of methane in the presence of nitrogen. ( )
3. Oxygen is very soluble in water. ( )
4. Rusting happens in the presence of nitrogen in the humid air. ( )



## الصف السادس الابتدائي

## Ongoing Assessment &amp; Exams

## 3 (A) What happens when ...?

5m

1. You blow in a jar that contains clear limewater.
2. The percentage of carbon dioxide gas in air decreases.

## (B) Complete the following sentences:

1. Carbon dioxide gas is not collected by downward displacement of water because it \_\_\_\_\_.
2. \_\_\_\_\_ is used to detect the presence of carbon dioxide.
3. In \_\_\_\_\_ process, green plants absorb carbon dioxide to make their own food.
4. Exhaled air contains a large amount of \_\_\_\_\_ gas.
5. The gas which turns limewater turbid is \_\_\_\_\_ gas.
6. Carbon dioxide gas is produced as a result of the combustion of \_\_\_\_\_ substances and also produced from \_\_\_\_\_ of living organisms.

## 4 (A) Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

5m

1. Oxygen is produced as a result of combustion of wood, tobacco and coal. ( )
2. Passing Carbon dioxide gas through clear limewater turns its color into blue. ( )
3. Man suffers from suffocation after breathing carbon dioxide gas. ( )

## (B) Give a reason for each of the following:

1. Carbon dioxide gas is collected in the cylinder by upward displacement of air.
2. Clear limewater gets turbid if carbon dioxide passes through it.

(Total mark)

20

## Worksheet 11

5m

## 1 (A) Complete the following sentences:

- Carbon dioxide is used in making \_\_\_\_\_ that is used in refrigeration.
- Carbon dioxide gas is used in extinguishing fires as it doesn't burn and doesn't \_\_\_\_\_.
- Carbon dioxide gas is collected by \_\_\_\_\_ displacement of \_\_\_\_\_ as it is \_\_\_\_\_ than air.
- On putting a lighted magnesium ribbon in a cylinder filled with carbon dioxide a white substance of \_\_\_\_\_ is formed.

## (B) Write the scientific term for each of the following:

- A black substance deposits on the wall of a cylinder when putting a lighted magnesium ribbon in the cylinder filled with  $\text{CO}_2$ . (\_\_\_\_\_)
- The process performed by yeast releasing carbon dioxide. (\_\_\_\_\_)
- The chemical substance that is used to prepare carbon dioxide in the lab. (\_\_\_\_\_)

## 2 (A) Choose the correct answer:

5m

- Which of the following is from the uses of carbon dioxide gas?
  - Cutting and welding of metals
  - Formation of ozone layer
  - Making dry ice
  - Mechanical ventilation
- When opening soft drinks, \_\_\_\_\_ evolves.
  - oxygen
  - nitrogen
  - carbon dioxide
  - ozone
- \_\_\_\_\_ is used to prepare carbon dioxide.
  - Hydrochloric acid
  - Manganese dioxide
  - Calcium carbonate
  - All the previous answers
- All the following are sources of carbon dioxide except \_\_\_\_\_.
  - fermentation
  - fertilizers
  - respiration
  - combustion

## (B) Match:

(A)	(B)	(C)
1. Photosynthesis	occurs in the bread industry	uses oxygen.
2. Respiration	releases carbon dioxide	uses carbon dioxide.
3. Fermentation	produces oxygen	happens by yeast.

## Ongoing Assessment &amp; Exams

3 (A) Give a reason for each of the following:

5m

1. Yeast is added to dough on making bread.  
\_\_\_\_\_
2. Green plants filter the air.  
\_\_\_\_\_
3. Clear limewater is used to detect the presence of carbon dioxide gas.  
\_\_\_\_\_

(B) Correct the underlined words:

1. Carbon dioxide dissolves scarcely in water.  
\_\_\_\_\_
2. Dilute hydrochloric acid reacts with sodium chloride to produce carbon dioxide.  
\_\_\_\_\_
3. Green plants consume oxygen gas during photosynthesis process.  
\_\_\_\_\_
4. A black precipitate is formed when carbon dioxide passes through clear limewater.  
\_\_\_\_\_

4 (A) What happens if ...?

5m

1. A lighted candle is put in a cylinder filled with carbon dioxide gas.  
\_\_\_\_\_
2. Lemon juice is added to sodium bicarbonate.  
\_\_\_\_\_
3. The pressure on liquefied carbon dioxide is relieved.  
\_\_\_\_\_

(B) How can we obtain carbon dioxide from calcium carbonate?

\_\_\_\_\_

\_\_\_\_\_

3

Nitrogen

Answer Guide: P. 33

(Total mark)

20

5m

## Worksheet 12

## 1 (A) Complete the following sentences:

1. Nitrogen is a chemical element found in nature in a \_\_\_\_\_ state.
2. Nitrogen molecule consists of \_\_\_\_\_ nitrogen atoms and its symbol is \_\_\_\_\_.
3. Nitrogen is used in filling \_\_\_\_\_ and some types of \_\_\_\_\_.
4. Legumes form the protein with the help of a certain type of \_\_\_\_\_ that live in \_\_\_\_\_.

## (B) Give a reason for each of the following:

1. Nitrogen is called lifeless gas.
2. All living organisms need nitrogen to live.
3. Nitrogen is used in the manufacturing of ammonia and ammonium nitrate.

## 2 (A) Put (✓) in front of the right statement and (X) in front of the wrong one:

5m

1. Nitrogen contributes in the composition of all living tissues. ( )
2. Nitrogen is a very important gas as it forms protein substances. ( )
3. Nitrogen gas easily dissolves in water. ( )
4. Nitrogen gas represents 78% of the air volume. ( )
5. Nitrogen is used to make stainless steel. ( )

## (B) What happens in case of ...?

1. Killing soil bacteria.  
\_\_\_\_\_
2. The absence of nitrogen in the atmosphere.  
\_\_\_\_\_

## Ongoing Assessment &amp; Exams

## 3 (A) Write the scientific term for each of the following:

5m

1. The gas that contributes in the composition of proteins and tissues of living organisms. ( )
2. The scientist who discovered nitrogen gas. ( )
3. The most abundant gas in the atmosphere. ( )
4. The main source of nitrogen gas. ( )

## (B) Choose the correct answer:

1. Nitrogen oxide is formed during the .  
 a. ammonia industry                      b. lightning  
 c. bread industry                          d. fermentation
2. Which of the following gases has the greatest percentage in the atmospheric air?  
 -  
 a. Oxygen                                      b. Nitrogen  
 c. Carbon dioxide                          d. Water vapor

5m

## 4 (A) Compare between:

1. Number of atoms in each of nitrogen molecule and carbon dioxide molecule.

P.O.C	Nitrogen molecule	Carbon dioxide molecule
Number of atoms		

## (B) Correct the underlined words:

1. Car tires are filled with oxygen which keeps its volume constant at different temperature. ( )
2. Nitrogen is also called azote which means life gas. ( )
3. The nodular bacteria fix oxygen in the roots of leguminous plants. ( )
4. Nitrogen molecule consists of three nitrogen atoms. ( )
5. During lightning, nitrogen reacts with oxygen in the air forming carbon dioxide. ( )

# School BOOK Exercises

Unit 3

Answer Guide: P 34

1 Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

- The nodular bacteria fix oxygen of air in the roots of leguminous plants such as beans and clover. ( )
- Oxygen gas occupies 78% of the atmospheric air components. ( )

2 Justify:

- The clear limewater is used in the detection of carbon dioxide gas.

3 Explain how you get:

- Oxygen gas from hydrogen peroxide.

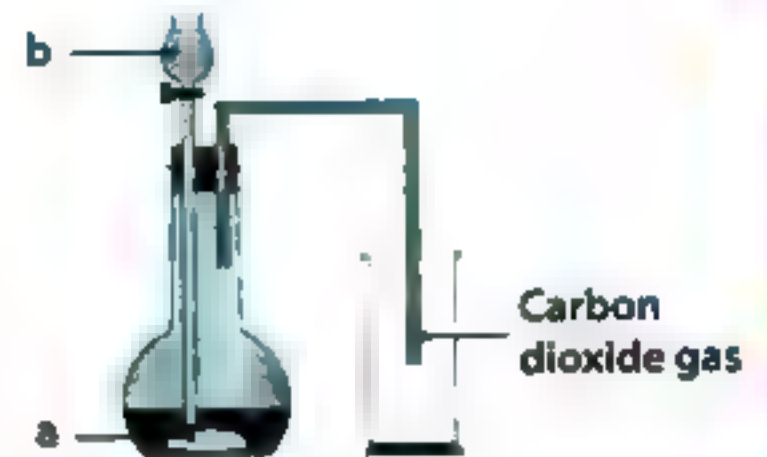
- Carbon dioxide gas from wood.

## Ongoing Assessment &amp; Exams

4 Look at the opposite figure, then answer:

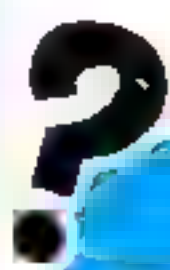
1. Write what represents each label on the figure:

- Substance (a): .....
- Liquid (b): .....



2. Mention some uses of carbon dioxide gas:

1. ....
2. ....
3. ....



# Al-Adwaa

## General Tests on Unit

3

Answer Guide: P. 34

### Test 1

(Total mark)

20

5m

#### 1 (A) Correct the underlined words:

1. The increase in oxygen percentage is responsible for global warming.
2. Oxyacetylene flame is produced by burning of methone in the presence of oxygen.
3. The slow combination of an element and oxygen gives light and heat.
4. Nitrogen turns limewater milky.
5. Fire extinguishers produce nitrogen to put out fires.

#### (B) Mention the name of the gas used in:

1. The manufacturing of gun powder. ...
2. Cutting and welding of metals. ....
3. Photosynthesis process.
4. Baking bread and cakes.
5. The composition of water. ....

5m

#### 2 (A) Choose the correct answer:

1. The most abundant element in the earth's atmosphere is . ....  
a. water                      b. nitrogen                      c. oxygen                      d. carbon dioxide
2. The element whose percentage is very little about 0.03% is .....  
a. water                      b. nitrogen                      c. oxygen                      d. carbon dioxide
3. .... is a form of oxygen with 3 oxygen atoms in each molecule.  
a. Ozone                      b. Nitrogen                      c. Oxygen                      d. Carbon dioxide
4. Which of the following gases form water molecule? – .....  
a. Hydrogen and oxygen                      b. Nitrogen and oxygen  
c. Oxygen and nitrogen                      d. Carbon dioxide and nitrogen

#### (B) Give a reason for each of the following:

1. Carbon dioxide gas is not collected by the downward displacement of water.
2. Nitrogen is used in filling car tires.

## Ongoing Assessment &amp; Exams

3 (A) Look at the opposite apparatus and answer the questions below:

5m

1. What happens to limewater in the jar after a while?
2. What is the process done by the germinated seeds?



(B) Write the importance of ...:

1. Catalyst.
2. limewater.
3. The oxyacetylene flame.

4 (A) Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

5m

1. Oxygen is collected during its preparation in lab by upward displacement of air. ( )
2. Hydrogen peroxide works as a catalyst in the preparation of oxygen gas. ( )
3. The ozone layer protects the earth from the harmful radiations that come from the sun. ( )
4. Carbon dioxide gas is used in making dry ice and soft drinks. ( )
5. The atmosphere is attracted to the earth by the effect of gravity. ( )

(B) Compare between respiration and photosynthesis:

Points of comparison	Respiration	Photosynthesis
1. Gas consumed		
2. Gas produced		

(Total mark)

20

5m

## Test 2

## 1 (A) Write the scientific term for the following:

1. The gas that combines with  $O_2$  to produce a flame with high temperature that reaches  $3500^\circ C$ . ( )
2. A rapid union of oxygen with an element producing heat and light. ( )
3. The chemical substance that is used to detect (test) the presence of  $CO_2$  gas. ( )
4. The chemical substance that is added to calcium carbonate during the preparation of  $CO_2$  gas. ( )

## (B) What happens in the following cases?

1. Nitrogen gas is not present in the atmosphere.
2. Oxygen reacts with nitrogen during lightning.
3. A lighted magnesium ribbon is put in a jar of carbon dioxide.

## 2 (A) Choose from column (A) what suits in column (B):

5m

(A)	(B)
1. Catalyst	a. protects the earth from harmful radiations.
2. Respiration	b. is made by yeast.
3. Ozone	c. contain nitrogen.
4. Fermentation	d. uses oxygen and releases carbon dioxide.
5. Fertilizers and nitrates	e. makes reactions faster without changing in its quantity or properties.
1. ....	2. ....
3. ....	4. ....
5. ....	5. ....

## (B) Give a reason for each of the following:

1. Iron nails rust when exposed to moist air.
2. Ozone layer is very important for the life of all living organisms.
3. Mountains climbers use oxygen cylinders.

## Ongoing Assessment &amp; Exams

3 (A) Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

5m

1. Nitrogen gas is the most abundant gas in air.
2. Carbon dioxide is heavier than air.
3. Oxygen is used in soft drinks industry.
4. Nitrogen gas is easily soluble in water.

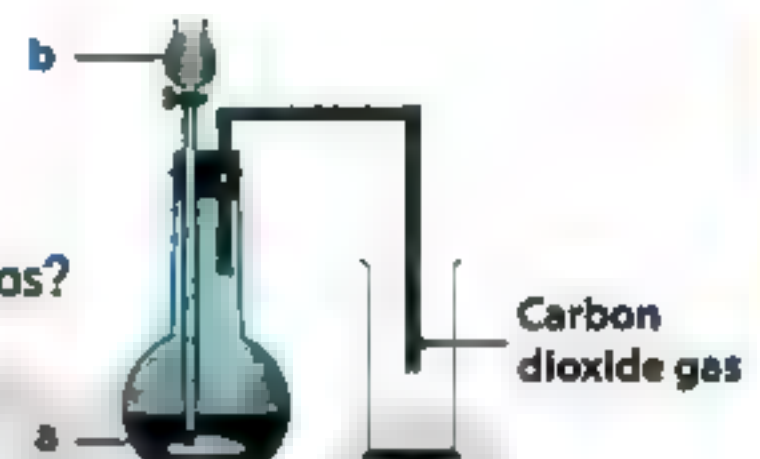
( )  
( )  
( )  
( )

(B) Look at the opposite figure, then answer:

1. Write what each label represents:

- Substance (a): .....
- Liquid (b): .....

2. How can we detect the presence of carbon dioxide gas?



4 (A) Correct the underlined words:

5m

1. Carbon dioxide is produced during photosynthes s process.
2. Nitrogen gas represents 87% of the atmosphere volume.
3. Nitrogen is known as the life gas.
4. Ozone molecule consists of 4 atoms.

( ..... )  
( ..... )  
( ..... )  
( ..... )

(B) Write the importance and uses of carbon dioxide.

# Unit 4 Structure and Function of Living Organisms

1

## Human Nervous System

Answer Guide: P. 35

### Worksheet 13

(Total mark)

20

5m

#### 1 (A) Complete the following sentences:

1. \_\_\_\_\_ is a communicating and controlling body system.
2. \_\_\_\_\_ is the building unit of the nervous system.
3. The central nervous system consists of \_\_\_\_\_ and \_\_\_\_\_.
4. The two cerebral hemispheres contain the centers of \_\_\_\_\_ and \_\_\_\_\_.
5. The skull protects the \_\_\_\_\_, while the backbone protects \_\_\_\_\_.

#### (B) Put (✓) in front of the right statement and (X) in front of the wrong one:

1. The medulla oblongata is responsible for controlling the voluntary processes. ( )
2. Synapse is formed as a result of connection of nerve cell's axon. ( )
3. The spinal cord controls the heartbeats. ( )
4. The outer part of the brain is a white matter. ( )

#### 2 (A) Write the scientific term for each of the following:

1. The system which receives information from the environment and makes the body respond to it. ( )
2. Branches extending from the body of the neuron. ( )
3. A fatty layer covering the axons of neurons. ( )
4. The outer layer of the two cerebral hemispheres. ( )

#### (B) What happens in the following cases?

1. The absence of dendrites and axon terminals.
2. The medulla oblongata is damaged.
3. The cerebellum is shocked or infected.

## Ongoing Assessment &amp; Exams

## 3 (A) Choose the correct answer:

5m

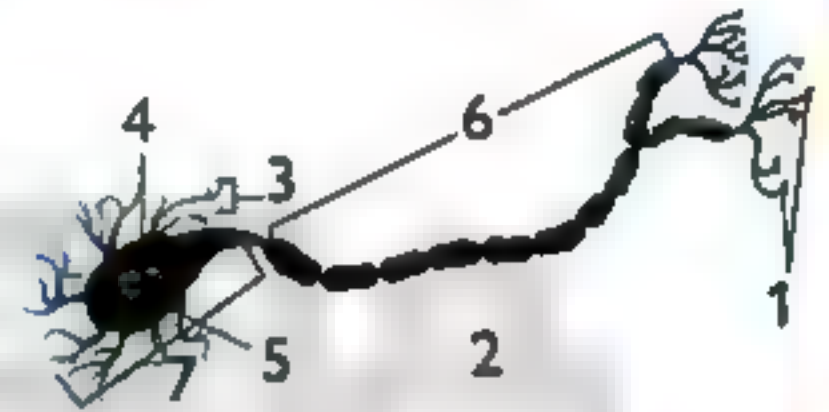
- The spinal cord is responsible for .....
  - thinking
  - the body's balance
  - the reflex actions
  - movement
- The ..... controls the voluntary movements such as running in a race.
  - cerebrum
  - cerebellum
  - medulla oblongata
  - spinal cord
- Keeping the body balance during movement is the function of the .....
  - cerebellum
  - cerebrum
  - medulla oblongata
  - spinal cord
- ..... connect(s) the brain with the spinal cord.
  - The cerebrum
  - The cerebellum
  - The medulla oblongata
  - Axon terminals

## (B) Look at the opposite figure, then answer:

- This figure represents: ..
- Label the figure.

- .....
- .....
- .....
- .....
- .....
- .....
- .....

- .....
- .....
- .....
- .....
- .....
- .....
- .....



## 4 (A) Give a reason for each of the following:

5m

- There are branches called dendrites which extend from the neuron's body.
- The brain is the main control center in the human body.
- Medulla oblongata keeps you alive during sleeping.

## (B) Compare between the cerebrum and cerebellum:

Points of comparison	Cerebrum	Cerebellum
1. Description	.....	.....
2. Location	.....	.....
3. Function	.....	.....

(Total mark)

20

5m

## Worksheet 14

## 1 (A) Complete the following sentences:

1. The nerves which emerge from the brain are called ..... nerves and their number is ..... pairs.
2. .... is a spontaneous response of the body to different stimuli.
3. Over intake of stimulating substances such as tea and coffee affects ..... and .....
4. We must stay away from ..... and ..... to keep the nervous system healthy.

## (B) Correct the underlined words:

1. The cranial nerves extend from the spinal cord. (.....)
2. The number of spinal nerves is 12 pairs. (.....)
3. The branches extending from the neuron's body are called axon terminals. (.....)

## (C) What happens in the following cases...?

1. Over drinking of coffee and tea.  
.....
2. A human is exposed to noise constantly.  
.....

## 2 (A) Write the importance of ...:

5m

1. Skull.  
.....
2. The peripheral nervous system (nerves).  
.....

## (B) Give a reason for each of the following:

1. Blinking of the eyelids when an object approaches the eye suddenly.  
.....
2. Avoid sitting for long periods in front of the computer.  
.....

## Ongoing Assessment &amp; Exams

**3** (A) Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

5m

1. To keep the nervous system healthy, we must stay away from tranquilizers and stimulants.
2. The peripheral nervous system consists of 43 pairs of nerves.
3. The neuron is the building unit of the nervous system.
4. The white matter of the spinal cord has the shape of letter H.
5. Dendrites are branches extending from the axon of neurons.

( )  
( )  
( )  
( )  
( )

(B) Define each of the following:

1. The neuron.
2. Cranial nerves.

(C) Mention some examples for the reflex action.

**4** (A) Choose from column (A) what suits in column (B):

5m

(A)	(B)
1. The brain	a. is located inside the backbone.
2. The spinal cord	b. extend from the brain.
3. Spinal nerves	c. extend from the spinal cord.
4. Cranial nerves	d. is located inside the skull.

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_ 4. \_\_\_\_\_

(B) Compare between the brain and the spinal cord:

Points of comparison	Brain	Spinal cord
1. Description		
2. Location		
3. Function		

2

## Human Locomotory System

Answer Guide: P. 36

## Worksheet 15

(Total mark)

20

5m

## 1 Choose the correct answer:

- All the following systems participate in the process of movement except the .....  
 a. nervous system                      b. skeletal system  
 c. muscular system                      d. digestive system
- Human backbone consists of ..... vertebrae.  
 a. 12                      b. 33                      c. 43                      d. 31
- The ..... protects the spinal cord.  
 a. skull                      b. backbone                      c. femur                      d. humerus
- Human rib cage protects the .....  
 a. lungs                      b. heart                      c. spinal cord                      d. (a) and (b)
- Femur bone belongs to the bones of .....  
 a. upper limbs                      b. lower limbs                      c. backbone                      d. axial skeleton

## 2 (A) Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

5m

- The locomotory system is the system that is responsible for applying movement. ( )
- The axial skeleton consists of the skull, backbone and rib cage. ( )
- The rib cage of human consists of 10 pairs of ribs. ( )

## (B) What happens in the following cases ...?

- Absence of cartilages between vertebrae of the backbone.  
 .....
- The backbone consists of one bone.  
 .....

## Ongoing Assessment &amp; Exams

3 (A) Write the scientific term for each of the following:

5m

1. The system that is built up of the skeletal system and the muscular system. (.....)
2. A system consisting of the axial skeleton and appendicular skeleton. (.....)
3. A bone case containing cavities for eyes, ears and the nose. (.....)
4. The structure that allows the body to bend in different directions. (.....)
5. The first bone of the upper limb that is connected to the shoulder bone. (.....)

(B) Write the importance of ...:

1. Bones of the upper limbs.
2. Freely movable joints.

4 (A) Give a reason for each of the following:

5m

1. Upper limbs have great importance for the human body.
2. Presence of the brain inside the skull.
3. The rib cage surrounds the heart and lungs.

(B) Define each of the following:

1. The axial skeleton.
2. Joints.

(Total mark)

20

## Worksheet 16

5m

## 1 (A) Complete the following sentences:

1. There are three types of joints which are \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
2. Knee joint is from \_\_\_\_\_ joints, while shoulder joint is from \_\_\_\_\_ joints.
3. \_\_\_\_\_ helps in the processes of inhalation and exhalation.
4. The human locomotory system consists of \_\_\_\_\_ and \_\_\_\_\_.
5. The rib cage consists of \_\_\_\_\_ pairs of ribs.

## (B) Compare between the axial skeleton and the appendicular skeleton:

Point of comparison	Axial skeleton	Appendicular skeleton
Structure		

5m

## 2 (A) Correct the underlined words:

1. Vertebral column consists of 35 vertebrae. ( )
2. The backbone protects the sternum. ( )
3. The shoulder joint is an immovable joint. ( )

## (B) What happens in the following cases?

1. Shoulder joints become slightly movable joints.
2. The hip joint has a limited movement.
3. The absence of cartilages between vertebrae of the backbone.

5m

## 3 (A) Give a reason for each of the following:

1. There are cartilages between vertebrae.
2. Elbow joint is a slightly movable joint.
3. The backbone has great importance for the human body.

## Ongoing Assessment &amp; Exams

(B) Write the scientific term for each of the following:

1. The structure which consists of skull, backbone and rib cage. (.....)
2. Areas between vertebrae of the vertebral column which separate and protect vertebrae from friction during movement. (.....)
3. The joint which doesn't allow any movement. (.....)

5m

4 (A) Determine the type of the following joints:

1. The knee joint.

2. The shoulder joint.

3. Skull joints.

4. The thigh joint.

(B) State the function of each of the following:

1. The skull.

2. The backbone.

3. The rib cage.

(C) Compare between backbone and rib cage.

Backbone	Rib cage
.....	.....
.....	.....

# School BOOK Exercises

## on Unit 4

Answer Guide: P. 37

### 1 Choose the correct answer:

- Myelin sheath surrounds the .....  
 a. nerve cell axon                      b. cerebellum                      c. spinal cord
- Reflex action takes place through the .....  
 a. medulla oblongata                      b. cerebral hemispheres  
 c. spinal cord
- The joint is the location of meeting of .....  
 a. two bones                      b. a muscle with a bone  
 c. two muscles
- Skull joints are .....  
 a. immovable                      b. slightly movable                      c. freely movable

### 2 Write the scientific term for each of the following statements:

- The building unit of the nervous system. ( ..... )
- The organ which consists of an internal H-shaped gray matter surrounded with a white matter. ( ..... )
- The autonomic body response towards different stimuli. ( ..... )
- The skeleton which includes the upper and lower limbs. ( ..... )

### 3 Mention the location of the following parts in the human body:

- Medulla oblongata.  
 \_\_\_\_\_
- The H-shaped gray matter.  
 \_\_\_\_\_

## Ongoing Assessment &amp; Exams

c. The cerebellum.

d. The spinal cord.

**4** State the importance of each of the following:

a. Joints.

b. Rib cage.

c. Cerebellum.

d. Cerebral hemispheres.

**5** Give reasons:

a. The rapid withdrawal of the hand suddenly on touching thorns of a plant.

b. Damage of medulla oblongata may lead to death.

## 4

(Total mark)

20

5m

**1 (A) Complete the following sentences:**

- ### (B) What is meant by ...?

1. Dendrites.
2. The cerebellum.
3. Freely movable joints.
4. The backbone.

## 5m

1. The neuron is the building unit of the 
  - a. skeletal system
  - b. nervous system
  - c. muscular system
  - d. locomotory system
2. All the following are parts of the brain except the 
  - a. cerebrum
  - b. cerebellum
  - c. medulla oblongata
  - d. spinal cord
3. Elbow joint is from the  joints.
  - a. freely movable
  - b. slightly movable
  - c. immovable
  - d. fully movable

**1. The joints between the bones of skull are immovable.**

- 2. There are cartilages between the vertebrae of the backbone.**

## Ongoing Assessment &amp; Exams

3 (A) Write the scientific term for each of the following:

5m

1. The communicating and controlling body system. (.....)
2. The part of the nervous system which is responsible for reflex actions. (.....)
3. Axis of the skeleton in the human body. (.....)
4. The part of the axial skeleton that helps in inhalation and exhalation processes. (.....)

(B) Write the importance of ...:

1. The medulla oblongata.
2. The skull.

4 (A) Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

5m

1. The number of cranial nerves is 31 pairs. ( )
2. The first 10 pairs of ribs are connected anteriorly to the sternum. ( )
3. The rib cage of the human body consists of 12 pairs of ribs. ( )
4. Wrist joint is from the freely movable joints. ( )

(B) What happens if ...?

1. The cerebellum is shocked hardly.
2. The backbone consists of one bone.

## Test 2

(Total mark)

20

5m

## 1 (A) Choose the correct answer:

- All the following are from the constituents of the human skeletal system except .....  
 a. skull  
 b. rib cage  
 c. backbone  
 d. spinal cord
- The myelin sheath surrounds the .....  
 a. axon on the nerve cell  
 b. spinal cord  
 c. cerebellum  
 d. brain
- The human rib cage protects the .....  
 a. heart  
 b. lungs  
 c. brain  
 d. (a) and (b)
- The joint which allows the movement in one direction only is called .....  
 a. immovable  
 b. freely movable  
 c. slightly movable  
 d. no correct answer

## (B) Write the scientific term for each of the following:

- The structure that allows the body to bend in different directions. (.....)
- The nerve block which is located inside the skull. (.....)
- The area at which two bones meet. (.....)

## 2 (A) Choose from column (A) what suits in column (B):

5m

(A)	(B)
1. The backbone	a. belongs to the bones of upper limbs.
2. The rib cage	b. belongs to the bones of lower limbs.
3. The forearm	c. protects the heart and lungs.
4. The leg	d. protects the spinal cord.

1. .... 2. .... 3. .... 4. ....

## Ongoing Assessment &amp; Exams

(B) Give a reason for each of the following:

1. The cerebrum is a very important part of the brain.
2. Upper limbs have great importance for the human body.

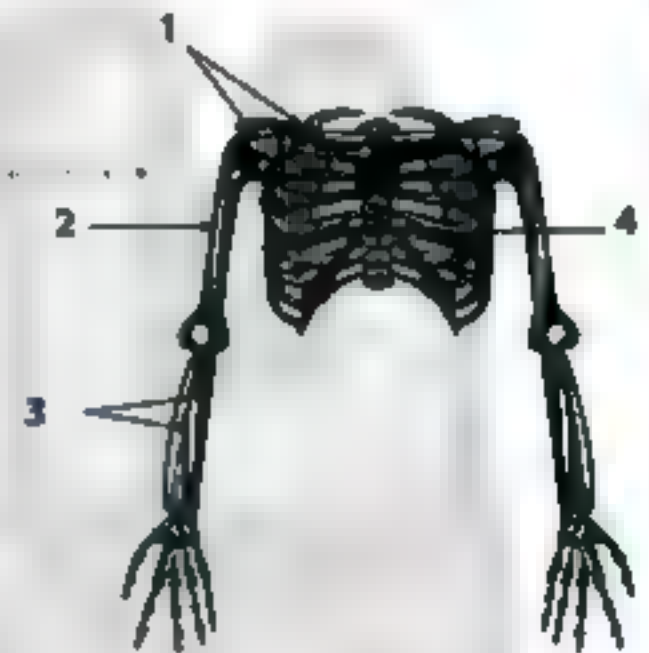
3 (A) Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

5m

1. Inhalation is the ability of the living organism to change its position from a place to another. ( )
2. Elbow joint is an immovable joint. ( )
3. The peripheral nervous system consists of 43 pairs of nerves. ( )
4. The skeleton of lower limbs consists of humerus, two forearm bones and bones of hands. ( )

(B) Look at the opposite figure, then answer:

1. The opposite figure represents the bones of .....
2. Label the figure:
  1. ....
  2. ....
  3. ....
  4. ....
3. What is the importance of the structure no. 3?



5m

4 (A) Correct the underlined words:

1. The organ that is responsible for the reflex action is the cerebrum. (.....)
2. The internal gray matter of the spinal cord has the shape of letter N. (.....)
3. From the examples of immovable joints are the joints between bones of the backbone. (.....)

(B) Mention 3 ways to maintain the human nervous system healthy:

part  
(2)

## Monthly Exams on the First Term



### ► Contents:

#### ► October

- Model (1)

- Model (2)

#### ► November

- Model (1)

- Model (2)

#### ► December

- Model (1)

- Model (2)

## Ongoing Assessment &amp; Exams

## October Models

(Answer Guide P. 38)

## Model 1

20

Choose the correct answer:

- If the mass of a body on the moon's surface is 10 kg, then its mass on the earth's surface equals .....  
 a. 10 kg      b. 10 N      c. 60 kg      d. 60 N
- The measuring unit of mass is .....  
 a. Newton      b. kilogram      c. liter      d. centimeter
- The mass of half a liter of distilled water equals .....  
 a. 5g      b. 50 g      c. 5000 g      d. 500 g
- ..... equals the mass of one paper clip.  
 a. Gram      b. Newton      c. Kilogram      d. Liter
- One of the tools that is used for measuring mass is the .....  
 a. kilogram      b. balance scale      c. Newton      d. spring scale
- The measuring unit of weight is .....  
 a. gram      b. liter      c. Newton      d. kilogram
- Newton equals the weight of an object whose mass equals .....  
 a. 100 grams      b. liter      c. 10 grams      d. kilogram
- ..... is the device which is used for measuring weight.  
 a. One-arm scale      b. Two-arm scale      c. Digital scale      d. Spring scale
- The object which weighs 20 N on the earth, its mass equals .....  
 a. 2 kg      b. 10 kg      c. 20 kg      d. 200 kg
- If an object's mass on the earth's surface is 6 kg, then its weight on the moon's surface is .....  
 a. 6 kg      b. 6 N      c. 60 N      d. 10 N

11. Heat transfers from .....  
 a. a hot object to a cold one  
 b. a cold object to a hot one  
 c. a heat conductor to a heat insulator  
 d. a heat insulator to a heat conductor
12. Scientists classify the materials into .....  
 a. heat insulators only  
 b. heat conductors only  
 c. (a) and (b)  
 d. heat conductors and metals
13. Copper is a good conductor of heat because it .....  
 a. conducts heat  
 b. does not allow heat to flow through  
 c. is a heat insulator  
 d. all the previous answers
14. Which of the following conducts heat faster? – .....  
 a. Iron                      b. Aluminum                      c. Copper                      d. Glass
15. Cooking utensils are provided with handles of .....  
 a. copper                      b. wood                      c. iron                      d. aluminum
16. The temperature of the human body is measured by the .....  
 a. Celsius thermometer  
 b. clinical thermometer  
 c. thermostat  
 d. (a) and (b)
17. The bulb of the medical thermometer is filled with .....  
 a. alcohol                      b. water                      c. mercury                      d. air
18. The clinical thermometer is distinguished from the Celsius thermometer by the presence of a .....  
 a. capillary tube                      b. glass bulb                      c. constriction                      d. (a) and (b)
19. We can measure the temperature of boiling water using the .....  
 a. medical thermometer  
 b. Celsius thermometer  
 c. thermostat  
 d. clinical thermometer
20. The lower point of the Celsius thermometer is ..... and it represents the melting point of ice.  
 a.  $100^{\circ}\text{C}$                       b.  $50^{\circ}\text{C}$                       c.  $0^{\circ}\text{C}$                       d.  $37^{\circ}\text{C}$



3 (A) Give a reason for each of the following:

5

1. The weight of an object is affected by its mass.

2. The medical thermometer must be sterilized before using.

(B) If the weight of an object is 600 N on the earth, calculate:

1. Its mass on the earth.

2. Its mass on the moon.

3. Its weight on the moon.

4 (A) What happens if ...?

5

1. The mass of an object increases.

2. Handles of cooking pots are made of aluminum.

(B) Choose from column (A) what is suitable for column (B):

(A)	(B)
1. The gravitational force acting on a body's mass.	a kilogram.
2. The measurement unit of a light body's mass.	b. spring scale.
3. The measurement tool of weight.	c weight.
4. The amount of materials in an object.	d. weight increases.
5. By increasing the mass of the planet,	e gram.
6. The measurement unit of a heavy body's mass.	f mass.

1. .... 2. .... 3. .... 4. .... 5. .... 6. ....

## Ongoing Assessment &amp; Exams

## November Models

## Model 1

20

Choose the correct answer:

- The most abundant element in the Earth's atmosphere is .....  
 a. water                      b. nitrogen                      c. oxygen                      d. carbon dioxide
- Oxygen gas represents ..... of the Earth's atmosphere.  
 a. 0.03%                      b. 21%                      c. 78%                      d. 12%
- The main source of oxygen gas in air is produced from .....  
 a. photosynthesis                      b. respiration                      c. combustion                      d. burning
- Hydrogen peroxide decomposes in the presence of manganese dioxide into .....  
 a. oxygen and hydrogen                      b. oxygen and water  
 c. hydrogen and water                      d. hydrogen and manganese
- ..... gas is used with acetylene to weld metals.  
 a. Oxygen                      b. Nitrogen  
 c. Carbon dioxide                      d. Hydrogen
- Photosynthesis process in plants depends on the presence of .....  
 a. oxygen                      b. ozone  
 c. carbon dioxide                      d. nitrogen
- When the exhaled gas passes through clear limewater, it becomes turbid forming a substance called .....  
 a. calcium carbonate                      b. calcium oxide  
 c. calcium hydroxide                      d. carbon dioxide
- Carbon dioxide gas is collected by the .....  
 a. upward displacement of air                      b. upward displacement of water  
 c. downward displacement of air                      d. downward displacement of water
- We can extinguish fires using ..... gas.  
 a. carbon dioxide                      b. oxygen                      c. nitrogen                      d. hydrogen

10. Carbon dioxide gas is ..... than air.  
 a. lighter                      b. heavier                      c. softer                      d. no correct answer
11. The molecule of nitrogen gas consists of ..... of nitrogen.  
 a. one atom                      b. two atoms                      c. three atoms                      d. four atoms
12. Nitrogen is considered the main component of .....  
 a. carbohydrates                      b. fats                      c. proteins                      d. (a), (b) and (c)
13. Legumes such as peas produce proteins by the help of ..... in their roots.  
 a. ammonia                      b. bacteria                      c. carbon dioxide                      d. (a) and (b)
14. The main source of nitrogen is .....  
 a. air                      b. water                      c. carbon dioxide                      d. (a) and (b)
15. Nitrogen is used to make ..... which doesn't rust.  
 a. iron                      b. stainless steel                      c. aluminum                      d. copper
16. Oxygen reacts with nitrogen during lighting composing compounds known as .....  
 a. ozone                      b. nitrogen                      c. nitrogen oxide                      d. potassium hydroxide
17. Calcium carbonate is used in the preparation of .....  
 a. hydrogen                      b. oxygen                      c. nitrogen                      d. carbon dioxide gas
18. The gas which is used to fill some types of lamps is .....  
 a. oxygen                      b. nitrogen                      c. hydrogen                      d. carbon dioxide
19. Carbon dioxide gas is used in the industry of .....  
 a. steel                      b. gun powder                      c. fertilizers                      d. soft drinks
20. Why do mountain climbers use oxygen equipment at the top of the world's highest mountains?  
 a. Because there is little nitrogen in the air at great heights.  
 b. Because there is no air at the top of very high mountains.  
 c. Because there is less oxygen in the air at great heights.  
 d. no correct answer.



**3 Write the scientific term for each of the following:**

5

1. The gas that combines with  $O_2$  to produce a flame with high temperature that reaches  $3500^\circ C$ . (.....)
2. A rapid union of oxygen with an element producing heat and light. (.....)
3. The chemical substance that is used to detect (test) the presence of  $CO_2$  gas. (.....)
4. The chemical substance that is added to calcium carbonate during the preparation of  $CO_2$  gas. (.....)
5. The gas that is used in filling some types of lamps. (.....)

**4 (A) Mention the name of the gas used in:**

5

1. Manufacturing of gun powder.
2. Cutting and welding of metals.
3. Photosynthesis process.

**(B) Give a reason for each of the following:**

1. Carbon dioxide gas is not collected by the downward displacement of water.  
.....
2. Although oxygen is consumed during respiration, its percentage remains stable in the atmosphere.  
.....

## Ongoing Assessment &amp; Exams

## December Models

20

## Model 1

Choose the correct answer:

- Dendrites are branches extending from the .....  
a. neuron's body    b. axon of neuron    c. spinal cord    d. brain
- Myelin sheath surrounds the .....  
a. nerve cell's axon    b. cerebellum  
c. spinal cord    d. cerebrum
- All the following are parts of the brain except the .....  
a. cerebrum    b. cerebellum  
c. medulla oblongata    d. spinal cord
- The outer surface of the two cerebral hemispheres is called the cerebral cortex and its color is .....  
a. red    b. orange    c. black    d. gray
- The five sensation centers are located in the .....  
a. two cerebral hemispheres    b. cerebellum  
c. medulla oblongata    d. spinal cord
- The vertebral column is a series of vertebrae that protect the .....  
a. spinal cord    b. cerebrum    c. cerebellum    d. (b) and (c)
- The peripheral nervous system consists of .....  
a. 43 pairs of nerves    b. 31 pairs of nerves  
c. 12 pairs of nerves    d. 44 pairs of nerves
- The ..... controls the reflex actions.  
a. spinal cord    b. cerebellum    c. cerebrum    d. brain
- The ..... connects the brain to the spinal cord.  
a. cerebrum    b. cerebellum  
c. medulla oblongata    d. axon terminals

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## Ongoing Assessment &amp; Exams

Model 2

20

## 1 Complete the following sentences:

5

1. \_\_\_\_\_ controls and regulates all the vital processes of the body.
2. \_\_\_\_\_ is the ability of an organism to change its position from a place to another.
3. The axial skeleton consists of \_\_\_\_\_ and \_\_\_\_\_.
4. The branches extending from the neuron's body are called \_\_\_\_\_.
5. \_\_\_\_\_ maintains the balance of the human body during movement.

## 2 Choose the correct answer:

5

1. The neuron is the building unit of the \_\_\_\_\_.
  - a. skeletal system
  - b. nervous system
  - c. muscular system
  - d. locomotory system
2. All the following are parts of the brain except the \_\_\_\_\_.
  - a. cerebrum
  - b. cerebellum
  - c. medulla oblongata
  - d. spinal cord
3. Elbow joint is from the \_\_\_\_\_ joints.
  - a. freely movable
  - b. slightly movable
  - c. immovable
  - d. fully movable
4. The \_\_\_\_\_ protects the spinal cord.
  - a. skull
  - b. backbone
  - c. femur
  - d. humerus
5. Human rib cage protects the \_\_\_\_\_.
  - a. lungs
  - b. heart
  - c. spinal cord
  - d. (a) and (b)

## 3 (A) Write the scientific term for each of the following:

5

1. The communicating and controlling body system. ( )
2. The part of the nervous system which is responsible for reflex actions. ( )
3. Axis of the skeleton in the human body. ( )

## (B) Write the importance of ... :

1. The medulla oblongata.
2. The skull.

## 4 (A) Give a reason for each of the following:

5

1. The joints between the bones of the skull are immovable.
2. There are cartilages between the vertebrae of the backbone.

## (B) Correct the underlined words:

1. The spinal cord controls the heartbeats. ( )
2. Bones of upper limbs are connected to the pelvic bones. ( )
3. The cronial nerves extend from the spinal cord. ( )

## Model Answers

- 7 1. There will be no movement between bones.  
2. It will move in all directions.  
3. It will move only in one direction.  
4. There will be no movement between bones.

- 8 1. It is the location at which bones meet each other.  
2. They do not allow for any movement.  
3. They allow for movement in one direction only.  
4. They allow for movement in all directions.

- 9 1. They allow for the movement between bones.  
2. They allow for the movement in all directions.

10

## Slightly movable joints Freely movable joints

1. Allow for the movement in only one direction.	1. Allow for the movement in all directions.
2. • Knee joint. • Elbow joint.	2. • Shoulder joint. • Thigh joint.

- 11 1. immovable. 2. freely movable.  
3. freely movable.

- 12 1. lower limbs  
2. 1. femur 2. shaft bone  
3. foot bones  
3. walking, sitting and carrying the rest of the body.  
4. a. pelvic is a freely movable joint  
b. knee is a slightly movable joint

## Like questions on Lesson 2

P. 214

- 1 1. a) protects and supports the body.  
2. c) skeletal, muscular and nervous.
- 2 (i) (A) humerus bone (B) forearm bones  
(C) elbow joint  
(ii) allowing the movement in one direction.  
(iii) The bone cannot move.
- 3 a. Skeleton made from bones.  
b. (i) helps us to move  
(ii) protects internal organs.  
c. Skull.
- 4 Refers to page 196

24

## Second: Ongoing Assessment &amp; Exams

## Unit 1 Force and Motion

## 1 Mass and Weight P. 3

## Worksheet 1

- 1 A) 1. mass  
2. two arm scale - one arm scale  
3. kilogram or gram  
4. increases  
5. place  
6. kilogram
- B) 1. Because the mass does not change by changing the place.  
2. To avoid vibrations.
- 2 A) 1. Kilogram  
2. Sensitive scale  
3. Kilogram
- B) Mass of water =  $M_2 - M_1 = 175 - 100 = 75$  grams
- 3 A) 1. equal  
2. gram - kilogram  
3. 1000  
4. mass
- B) 1. It is used for measuring mass of jewelry and chemicals in the lab.  
2. It is used for measuring the mass of vegetables and fruit.
- 4 A) 1. (X) kilogram  
2. (X) gram  
3. (X) balance scale  
4. (X) doesn't change
- B) 1. It means that the amount of gold in the ring equals 3 grams.  
2. It means that the mass of the chair equals 4 kilograms.

## Model Answers

## Worksheet 2

1 A) 1. (c)

2. (c)

3. (b)

4. (b)

B) 1. Balance scale: it is used to measure the mass of objects.

2. Spring scale: it is used to determine the weight of objects.

2 A) 1. (✓)

2. (✓)

3. (X) 20 N

4. (X) increases

B) 1. Due to the absence of gravity.

2. Because the gravity decreases by moving away from the center of the earth.

3. Because the gravitational force changes from a planet to another.

3 A) 1. spring scale

2. equal

3. the center

4. weight

B) 1. The weight of the object will increase.

2. All bodies will move away from the earth, and will be lost in space as they become weightless.

3. Their weight will decrease.

4 A) 1. weight

2. Newton

B) 1. a. Weight on the earth = 500 N.

b. Weight on the moon = 83.3 N.

c. Mass on the earth = 50 kg.

2. a. 2.5 N b. 0.416 N c. 250 g

## Worksheet 3

1 A) 1. constant - place.

2. balance - spring.

3. object mass - planet where the object exists - distance between object and the center of the planet.

4. sensitive balance.

5. decreases.

B) Mass on Earth =  $\frac{600}{10} = 60 \text{ kg}$ 

Mass on the moon = 60 kg

Weight on the moon =  $\frac{600}{6} = 100 \text{ N}$ 

2 A) 1. (b)

2. (b)

3. (b)

4. (d)

B) 1. The weight of object decreases to half.

2. The body pulls the wire of the spring downwards and the reading of the pointer increases.

3. Its weight decreases to 100 N.

3 A) 1. It attracts all living organisms to the earth's surface which makes them move easily on the earth.

2. It is used to measure large masses.

3. It is used to measure the weight of any object.

B) 1. 300 grams

2. 3 N

4 A) 1. It means that the gravitational force which attracts the body to the earth equals 400 Newton.

2. It means that the weight of the body on the earth equals 300 Newton.

B) 1. Because the earth has greater mass and gravitational force than the moon.

2. Because the gravitational force changes from one place to another.

## Model Answers

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1 1. spring scale

2. 2 kg

2 1. balance scale - spring scale

2. the change in place

3. the object's mass, the place where the object exists and the distance between the object and center of the planet.

3

Points of comparison	Mass	Weight
Definition	The amount of matter in an object.	The force by which the body is attracted to earth.
Units of measurement	Gram - Kilogram - Ton	Newton
Devices of measurement	• Balance scale. • Sensitive two-arm scale • One-arm digital scale • One-arm scale with a pointer	• Spring scale
Direction	• Has no effect on a certain direction	• Its effect is towards the center of the planet.
Effect of different places	• Constant.	• Variable.

4 1. Mass on the moon = 30 kg

2. Weight on the earth = mass  $\times$  10 =  $30 \times 10$   
= 300 Newton3. Weight on the moon = weight on the earth / 6  
=  $300 / 6 = 50$  NAl-Adwaa  
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## Test

1 A) 1. balance scale

2. mass

3. weight

4. kg

5. spring scale

B)

Points of comparison	Kilogram	Newton
Definition	It is one of the measuring units of mass that equals the mass of one liter of distilled water at the normal temperature.	It is the measuring unit of weight and it is almost equal to the weight of an object on the Earth's surface whose mass is 100 grams.

2 A) 1. one sixth

2. gram-kilogram.

3. sensitive scale - balance scale.

4. the center of the earth.

B) 1. The weight of this object increases.

2. The weight of the person decreases as the gravitational force of the Earth for this person decreases.

3. The mass remains as it is.

3 A) 1. equal 2. mass

3. two-arm balance scale

4. direct 5. weight

B) Weight on the moon =  $\frac{\text{weight on the earth}}{6}$ 

$$60 = \frac{\text{weight on the earth}}{6}$$

$$\text{Weight on the earth} = 60 \times 6 = 360 \text{ N}$$

$$\text{Weight} = \text{mass} \times 10.$$

$$\text{Mass} = \frac{\text{weight}}{10} = \frac{360}{10} = 36 \text{ kg}$$

## Model Answers

- 4 A) 1. a  
3. b

2. a  
4. d

- B) 1. The amount of matter in an object.  
2. The force by which a body is attracted to the earth.

## Test 2

- 1 A) 1. 3 N.

2. balance scale - spring scale.  
3. • mass of the object.  
• The planet where the object exists.  
• The distance between the object and the earth's center.  
4. Earth

- B) 1. Because as mass increases, weight increases.  
2. Because the weight of the apple = its mass (Kg)  $\times$  10.  
3. Because the mass of the moon is less than that of the earth and as the mass of the planet increases, its gravitational force increases.

- 2 A) 1. sensitive balance.  
2. mass  
3. kilogram  
4. spring scale  
5. balance scale  
6. Newton

- B) 1. The weight of the object decreases.  
2. All objects on the earth's surface don't have weight.

- 3 A) 1. weight.  
2. Equal.  
3. decreases  
4. weight

- B) 1. Weight on the earth = mass  $\times$  10  
=  $80 \times 10 = 800$  N  
2. Mass on the moon = 80 kg.  
3. Weight on the moon =  
$$\frac{\text{weight on the earth}}{6} = 133.3 \text{ N.}$$

- 4 A) 1. c  
3. a

2. d  
4. c

B)	Mass	Weight
1. kg/g		Newton
2. Balance scale		Spring scale
3. No direction.		Towards the center of the earth.
4. Does not change		Changes by changing the place.
5. It is the amount of matter in an object.		The force by which a body is attracted to the earth.

## 2 Thermal Energy

## 1 Heat Conduction P. 17

## Worksheet 4

- 1 A) 1. higher - lower  
2. temperature  
3. energy - thermometer  
4. bad - good  
5. paper- glass

- B) 1. (X) 2. (✓) 3. (X)

- 2 A) 1. heat insulators  
2. temperature  
3. heat conductors  
4. air

- B) 1. Heat doesn't transfer from one body to the other as they have the same temperature.  
2. We can't hold them with our hands as aluminum is a good conductor of heat.  
3. We can't make handles of cooking pots.

- 3 A) 1. b 2. b 3. c 4. a

- B) 1. Because it is used making and processing food, paper, glass and textile.  
2. Because glass doesn't let heat flow through it, while copper allows heat to flow through it.  
3. Because copper conducts heat faster than aluminum and iron.

## Model Answers

A)

Heat conductors	Heat Insulators
1. Materials that allow heat to flow through.	Materials that do not allow heat to flow through.
2. Aluminum, copper.	Wood, wool.
3. For making cooking pots.	For making handles of cooking pots.

- B) 1. The form of energy that transfers from an object of higher temperature to an object of lower temperature.
2. It is a device that is used to measure the temperature.

## Worksheet 5

- 1 A) 1. copper  
2. wood - plastic  
3. Heat insulators - woolen clothes  
4. gaps

- B) 1. aluminum  
2. copper  
3. different

- 2 A) 1. Accidents can occur easily because of the expansion of bars during summer.  
2. Your hand's temperature will decrease.

- B) 1. They are used for making cooking pots and kettles.  
2. They are used for making handles of cooking pots and irons.  
3. It is used in our daily life as cooking and in industry as food, paper, glass and textiles.

- 3 A) 1. Because it does not allow heat to flow through.  
2. Because they are good conductors of heat.  
3. To keep our bodies warm as they prevent the leakage of heat.
- B) 1. (X) temperature  
2. (X) hot to cold  
3. (✓)  
4. (X) heat insulators

- 4 A) 1. They are materials that allow heat to flow through.

2. It is the degree of hotness or coldness of a body.

- B) 1. b  
2. a  
3. c

- C) 1. Thermometer.  
2. Heat insulators.  
3. Heavy woolen clothes. 4. Heat.

## 2

## Measuring Temperature P. 21

## Worksheet 6

- 1 A) 1. mercury.  
2. the medical thermometer - the Celsius thermometer.  
3. medical.  
4. volume - temperature. 5. touch.

- B) 1. (c)  
2. (a)  
3. (b)  
4. (c)

- 2 A) 1. (✓)  
2. (X) 10.  
3. (X) 37

- B) 1. Mercury will return back quickly to the mercury bulb before determining the temperature reading.  
2. It will be damaged.

- 3 A) 1. constriction.  
2. mercury bulb.  
3. ethyl alcohol.
- B) 1. Because  
1. It is a good conductor of heat.  
2. It is a liquid silver metal that can be seen.  
3. It expands regularly by heat.  
4. It is in a liquid state between  $-39^{\circ}\text{C}$  and  $357^{\circ}\text{C}$ .
2. To prevent mercury from going back to the bulb quickly.

## Model Answers

- 4 A) 1. c  
2. d  
3. a  
4. b  
5. e
- B) 1. heating  
2. wide  
3. zero  
4. zero

## Worksheet 7

- 1 A) 1. b  
2. c  
3. d  
4. a
- B) 1. medical thermometer  
2. It is used to measure the temperature of the human body.  
3. mercury

- 2 A) 1. boiling  
2. human body  
3. shake
- B) 1. digital thermometer  
2. 100°C  
3. the medical thermometer

- 3 A) 1. In order not to break it as mercury is toxic.  
2. Because its scale is from 35°C to 42°C, while water boils at 100°C, so the thermometer would be broken.  
3. Because mercury is very toxic.

- B) 1. Microbes can transfer easily and may be infected by some diseases.  
2. Mercury will not go back to the bulb. We can't measure the temperature accurately.  
3. It will not give an accurate measurement

## 4 Medical thermometer Celsius thermometer

A) 1. Measures the temperature of the human body.	• Measures the temperature of liquids.
2. 35°C – 42°C.	• 0°C – 100°C.
3. Mercury.	• Mercury.
4. Has a constriction.	• Has no constriction.

- B) 1. It is a liquid metal used in making thermometers and helps in measuring the temperature.  
2. It is used to sterilize the medical thermometer to kill microbes.

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- 1 1. thermometer.  
2. Celsius thermometer, medical thermometer.  
3. aluminum, copper and stainless steel.  
4. wood, plastic and glass.

- 2 1. thermometer. 2. heat conductors.  
3. heat insulators.

3

Point of comparison	Good conductors of heat	Bad conductors of heat
Uses	Making cooking pots (utensils) and kettles.	Making handles of cooking pots, electric irons and kettles.

4

Points of comparison	Medical thermometer	Celsius thermometer
a) Usage	• It is used to measure the temperature of the human body.	• It is used to measure the temperature of liquids or weather.
Structure	1- A transparent thick glass tube. 2- A capillary tube closed from one of its ends. 3. A mercury bulb that is filled with mercury and connected to the other end of the capillary tube.	
Used liquid	• Mercury.	• Mercury.
Scale	• From 35°C to 42°C.	• From 0°C to 100°C

## Model Answers

Points of comparison	Good conductors of heat	Bad conductors of heat
b) Definition	• They are materials that allow heat to flow through.	• They are materials that do not allow heat to flow through.
Usage	• Making cooking pots (utensils) and kettles.	• Making of the handles of cooking pots, electric irons and kettles.
Examples	• aluminum, iron, copper, stainless steel	• wood, plastic, glass, paper liquids, gases (air)

- 5 1. (X) Celsius thermometer  
2. (X) From 0°C to 100°C  
3. (X) good conductor 4. (X) bad conductor

- 6 1) Because:
1. It is a liquid metal that can be seen easily through the capillary tube
  2. It is a good conductor of heat.
  3. It expands regularly to give an accurate measurement.
  4. It does not stick to the walls of the capillary tube.
  5. It remains liquid between (-39°C) and (357°C), so it gives a wide range for measuring temperature.
2. Because plastic and wood are heat insulators
  3. Because stainless steel and aluminum are good conductors of heat.
  4. To prevent mercury from going back to the bulb quickly in order to read the temperature easily.

## Al-Adwaa

### General Tests on Unit 2

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## Test 1

- 1 A) 1. hotness - coldness.  
2. heat.  
3. 35°C – 42°C.  
4. 10.  
5. liquid - good.

B) The idea of making the thermometer is the change in the volume of liquids as the temperature changes.

- 2 A) 1. b  
2. c  
3. a  
4. a  
5. b  
6. b

- B) 1. To avoid train accidents.  
2. To kill microbes.

- 3 A) 1. the medical thermometer.  
2. zero.  
3. mercury.  
4. copper.

- B) 1. To measure temperature.  
2. It is used to sterilize the medical thermometer.

- 4 A) 1. (✓)  
2. (✓)  
3. (X) 37°C  
4. (✓)

- B) 1. It will not be easy to handle it during cooking.  
2. Mercury will return back quickly to the mercury bulb before determining the temperature reading.

## Model Answers

## Test 12

1 A) 1. c 2. c 3. c 4. a 5. b

- B) 1. Heat.  
2. The medical thermometer.  
3. Constriction.  
4. Heat insulators.

2 A) 1. b 2. d 3. a 4. c

- B) 1. To prevent mercury from going back to the bulb quickly.  
2. Because it has a toxic substance which is mercury.  
3. Because it remains liquid between  $(-39^{\circ}\text{C})$  to  $(357^{\circ}\text{C})$ .

3 A) 1. (X) heat insulator.

2. (✓)  
3. (X) using ethyl alcohol.  
4. (X) all metals.

- B) 1. the medical thermometer.  
2. 1. the mercury bulb.  
2. constriction. 3. glass tube.  
4. capillary tube.  
3. measuring the temperature of the human body.

4 A) 1. liquids. 2. different.  
3. aluminum and stainless steel.  
4. expands. 5. 37

- B) Because:  
1. It is a good conductor of heat.  
2. It is a liquid metal that can be seen easily through the capillary tube.  
3. It does not stick to the walls of the capillary tube.  
4. It expands regularly by heat.  
5. It remains in a liquid state between  $-39^{\circ}\text{C}$  and  $357^{\circ}\text{C}$ .

## 3 The Atmosphere

1

Oxygen

P. 33

## Worksheet 8

1 A) 1. green plants

2. two  
3. nitrogen – oxygen  
4. hydrogen peroxide

- B) 1. Because it is compensated by the green plants during the photosynthesis process.  
2. Because oxygen scarcely dissolves in water.  
3. To act as a catalyst that speeds up the reaction and dissociates hydrogen peroxide into water and oxygen.

2 A) 1. atmosphere  
2. manganese dioxide  
3. oxygen  
4. respiration

- B) 1. photosynthesis  
2. water.  
3. downward

3 A) 1. d  
2. c  
3. d  
4. b

- B) 1. 1. hydrogen peroxide,  
2. oxygen gas.  
3. water.  
4. flask.  
5. manganese dioxide.  
2. Number 5 is a catalyst which speeds up the rate of the reaction, without any change in its quantity or its properties.  
3. It is collected by downward displacement of water because it scarcely dissolves in water.

## Model Answers

- 4 A) 1. The process that is performed by green plants that absorb carbon dioxide from air to produce food and oxygen.  
2. The chemical material which is used to make reaction go faster without any change in its quantity and properties.
- B) 1. The harmful ultraviolet radiations will reach the Earth from the outer space.  
2. The living organisms can't respire.  
3. Answer by yourself.

## Worksheet 9

- 1 A) 1. (X) and help in burning.  
2. (✓).  
3. (X) increases.  
4. (X) white powder.  
5. (✓)

B) Answer by yourself.

- 2 A) 1. Because the temperature of oxyacetylene flame reaches 3500 C which is sufficient to cut or weld metals.  
2. Because the ratio of oxygen gas decreases when we rise above the earth's surface.

- B) 1. c                      2. d  
3. b                      4. a

- 3 A) 1. ozone  
2. acetylene - oxygen  
3. rarely  
4. oxygen

- B) 1. Iron will combine with oxygen in the presence of moisture (water) so iron nails will rust.  
2. They will rust.  
3. The burning fragment is still burning.

- 4 A) 1. catalyst  
2. magnesium oxide  
3. acetylene  
4. combustion
- B) 1. c                      2. c                      3. c  
4. a                      5. b

## 2

## Carbon dioxide

P. 37

## Worksheet 10

- 1 A) 1. calcium carbonate.  
2. two - one.  
3. carbon dioxide.  
4. increasing.

- B) 1. Carbon dioxide    2. CO<sub>2</sub>    3. CO<sub>2</sub>

- 2 A) 1. c                      2. c                      3. c                      4. c

- B) 1. 1. funnel.  
2. CO<sub>2</sub>  
3. a glass flask with a stopper with two holes.  
4. cylinder.  
5. dilute hydrochloric acid.  
6. calcium carbonate.  
2. By upward displacement of air.  
3. It becomes turbid.

- 3 A) 1. Limewater turns into milky due to the presence of carbon dioxide in the exhaled air.  
2. Green plants can't make photosynthesis process, so the percentage of oxygen will decrease in the atmosphere and living organisms will die.

- B) 1. easily dissolves in water  
2. clear limewater.  
3. photosynthesis.  
4. carbon dioxide.  
5. carbon dioxide.  
6. organic -respiration.

## Model Answers

3

Nitrogen

P. 41

## Worksheet 12

1 A) 1. gaseous

2. two -  $N_2$ 

3. car tires - lamps

4. bacteria - roots

B) 1. Because it does not help in burning and is not included in the process of respiration.

2. Because it takes part in the composition of all living organisms' tissues.

3. To produce fertilizers.

2 A) 1. (✓)

2. (✓)

3. (X)

4. (✓)

5. (✓)

B) 1. Plants will not take nitrogen to make protein.

2. The protein substance that builds up the bodies of all living organisms is not formed.

3 A) 1. Nitrogen

2. Rutherford

3. Nitrogen

4. Air

B) 1. (b) 2. (b)

4 A) Answer by yourself.

B) 1. nitrogen

2. lifeless

3. nitrogen

4. two

5. nitrogen oxide

## Worksheet 11

1 A) 1. dry ice.

2. burn - help in burning.

3. upward-air-heavier.

4. magnesium oxide.

B) 1. carbon

2. fermentation

3. calcium carbonate

2 A) 1. c 2. c 3. c 4. b

B) 1. photosynthesis - produces oxygen - uses carbon dioxide.

2. respiration - releases carbon dioxide - uses oxygen.

3. fermentation - in the bread industry - happens by yeast.

3 A) 1. Because yeast produces carbon dioxide during fermentation which expands by heat making the bread porous and tasty.

2. Because it absorbs  $CO_2$  and gives oxygen gas.

3. Because clear limewater turns into milky when carbon dioxide gas passes through it.

B) 1. easily

2. calcium carbonate

3. carbon dioxide

4. white

4 A) 1. The lighted candle will be extinguished.

2. Carbon dioxide is produced.

3. Dry ice is formed.

B) Answer by yourself.

## Model Answers

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- 1 a. (X) nitrogen. b. (X) 21%
- 2 Because clear limewater becomes turbid when carbon dioxide passes through it, due to the formation of calcium carbonate which is insoluble in water.
- 3 a. By putting manganese dioxide (as a catalyst) on hydrogen peroxide (oxygen water) it dissociates into water and oxygen gas.  
b. By burning of organic compounds such as wood, carbon dioxide is produced.
- 4 1. a. Calcium carbonate.  
b. Dilute hydrochloric acid.  
2. 1. Refrigeration (carbon dioxide is used in making dry ice) which is used in refrigeration.  
2. It is used in extinguishing fires.  
3. It is used to make soft drinks.

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## Test 1

- 1 A) 1. carbon dioxide.  
2. acetylene 3. fast  
4. carbon dioxide  
5. carbon dioxide.  
B) 1. Nitrogen.  
2. Oxygen.  
3. Carbon dioxide.  
4. Carbon dioxide.  
5. Oxygen.
- 2 A) 1. b 2. d 3. a 4. a  
B) 1. Because it easily dissolves in water.  
2. For the relative constancy of its volume at the change of temperature.

- 3 A) 1. becomes turbid  
2. respiration  
B) 1. speeds up the chemical reaction  
2. It is used to detect the presence of carbon dioxide gas.  
3. It is used to weld and cut metals.
- 4 A) 1. (X) carbon dioxide.  
2. (X) manganese dioxide.  
3. (✓)  
4. (✓)  
5. (✓)  
B) Answer by yourself.

## Test 2

- 1 A) 1. acetylene.  
2. Burning (combustion).  
3. limewater.  
4. dilute hydrochloric acid.  
B) 1. The protein substance that builds up the bodies of all living organisms is not formed.  
2. Nitrogen dioxide gas will be formed and dissolves in rain.  
3. It will extinguish giving white substance of magnesium oxide & a black deposit of carbon.
- 2 A) 1. e  
2. d  
3. a  
4. b  
5. c  
B) 1. Because it reacts with oxygen in humid air forming rust of iron oxides.  
2. Because it protects the earth from harmful ultraviolet radiations.  
3. Because the ratio of oxygen gas decreases when we rise above the Earth's surface.

## Model Answers

3 A) 1. (✓) 2. (✓)

3. (X) carbon dioxide

4. (X) scarcely dissolve.

B) Answer by yourself.

4 A) 1. respiration.

2. 78%.

3. lifeless.

4. 3.

B) 1. It is used in extinguishing fires.

2. It is used in refrigeration.

3. It is used in making bread.

4. It takes part in photosynthesis process.

## 4 Structure and Function of Living Organisms

1

Human Nervous System P. 51

### Worksheet 13

- 1 A) 1. nervous system  
2. nerve cell (neuron)  
3. brain – spinal cord  
4. thinking – memory  
5. brain – spinal cord

B) 1. (X) 2. (X) 3. (X) 4. (X)

- 2 A) 1. Nervous system  
2. Dendrites  
3. Myelin sheath  
4. Gray matter

- B) 1. There will be no connection with neighboring nerve cells and synapse won't be formed.  
2. All the involuntary processes of body will be disturbed causing death.  
3. The person loses his balance during movement.

3 A) 1. c 2. a 3. a 4. c

B) Answer by yourself.

- 4 A) 1. To connect with neighboring neurons to form synaptic area.  
2. Because it regulates all vital processes, thinking, behavior and emotions.  
3. Because it is responsible for involuntary processes such as heartbeats.

B)	Cerebrum	Cerebellum
1. The largest part of the brain.	• Small part of the brain.	
2. The upper part of the brain	• At the back of the brain below cerebrum.	
3. Controlling voluntary action/ thinking/memory.	• Balance of the body during motion.	

### Worksheet 14

- 1 A) 1. cranial – 12.  
2. reflex action.  
3. sleeping periods – heartbeats.  
4. addiction – stimulants.

- B) 1. brain.  
2. 31.  
3. dendrites.

- C) 1. It affects passively sleeping periods and heartbeats causing nervous tension.  
2. This affects badly the nervous system.

- 2 A) 1. It protects the brain.  
2. Transferring pulses between the central nervous system and all body parts and vice versa.

- B) 1. Because of reflex action.  
2. Because it affects passively nervous system and exhausts the sensory organs.

- 3 A) 1. (✓) 2. (✓) 3. (✓)  
4. (X) gray.  
5. (X) axon terminals

## Model Answers

- B) 1. It is the building unit of the nervous system.  
2. Nerves that extend from the brain (12 pairs).  
C) 1. Withdrawal of the hand quickly when touching a hot surface.  
2. Blinking when something gets close to the eye.  
3. Secreting saliva on seeing or smelling good food.

- 4 A) 1. d 2. a 3. c 4. b

B)

Brain	Spinal cord
1. A nerve block containing millions of nerve cells.	• A cylindrical cord.
2. In the skull.	• In the vertebral column.
3. The main control center in the body.	• Reflex action. • It delivers nerve message from body organs to the brain and vice versa.

2

## Human Locomotory System

P. 55

## Worksheet 15

- 1 1. d 2. b 3. b 4. d 5. b

- 2 A) 1. (✓) 2. (✓)  
3. (X) 12 pairs

- B) 1. Friction between vertebrae will occur during their movement causing acute pain.  
2. It will be impossible to bend the body in all directions.

- 3 A) 1. the locomotory system.  
2. the skeletal system.  
3. the skull.  
4. the backbone. 5. the humerus.

- B) 1. They allow eating, drinking, writing and holding things.  
2. They allow movement in all directions.

- 4 A) 1. Because they allow eating, drinking, writing and holding things.  
2. To protect it.  
3. To protect them.

- B) 1. A part of the skeletal system made of the skull, the backbone and the rib cage.  
2. It is the location at which bones meet each other.

## Worksheet 16

- 1 A) 1. immovable – freely movable – slightly movable  
2. slightly movable – freely movable  
3. rib cage.  
4. skeletal – muscular  
5. 12

- B)

Axial skeleton	Appendicular skeleton
• Skull • Backbone • Rib cage	• Bones of upper limbs • Bones of lower limbs

- 2 A) 1. 33  
2. spinal cord  
3. freely movable

- B) 1. It moves in one direction of the arm.  
2. The hip joint will move in one direction only.  
3. Friction between vertebrae will occur during their movement causing acute pain.

- 3 A) 1. To prevent their friction during movement.  
2. Because it can move only in one direction.  
3. Because it protects the spinal cord and allows the body to bend in different directions.

- B) 1. Axial skeleton.  
2. Cartilages.  
3. Immovable joints.

## Model Answers

- 4 A) 1. slightly movable  
2. freely movable  
3. immovable  
4. freely movable
- B) 1. It protects the brain and has cavities for sense organs.  
2. It protects the spinal cord and allows movement in all directions.  
3. It protects the heart and lungs and helps in breathing.
- C) Answer by yourself.

## School Book Exercises

on Unit 4  
P. 59

- 1 1. nerve cell axon  
2. spinal cord  
3. two bones  
4. immovable
- 2 a. Nerve cell (Neuron).  
b. Spinal cord.  
c. Reflex action.  
d. Appendicular skeleton.
- 3 a. It lies above the spinal cord (connects brain to the spinal cord).  
b. It lies in the inner area of the spinal cord.  
c. It lies at the back area of the brain below the cerebrum.  
d. It extends with canal inside a series of vertebrae (the backbone).
- 4 a. They allow the movement between bones.  
b. It protects the lungs and heart (it helps in the inhalation and exhalation processes).  
c. It keeps the body's balance during movement.  
d. 1. They control the voluntary movements of the body like running in a race.  
2. They receive nerve impulses from sense organs and send the appropriate responses.

- 5 a. Due to the reflex action.  
b. Because it is responsible for regulating the involuntary processes, and any damage will affect heartbeats, breathing and that will lead to death.

## Al-Adwaa

### General Tests on Unit 4

P. 61

## Test 1

- 1 A) 1. the brain  
2. movement  
3. skull - backbone - rib cage  
4. dendrites  
5. cerebellum
- B) 1. Branches extending from the neurons body.  
2. The part of the brain that lies at the back area of the brain below the cerebrum and keeps the body balance during movement.  
3. The joints which allow movement in all directions.  
4. It consists of 33 vertebrae and it protects the spinal cord.
- 2 A) 1. b      2. d      3. b  
B) 1. Because they don't allow any movement.  
2. To prevent friction during movement.
- 3 A) 1. the nervous system  
2. the spinal cord.  
3. the backbone  
4. the rib cage  
B) 1. It controls involuntary movement such as heartbeats.  
2. It protects the brain.
- 4 A) 1. (X) 12 pairs      2. (✓)  
3. (✓)      4. (✓)  
B) 1. The body will lose its balance.  
2. The body will not be able to bend in different directions.

## Model Answers

## Test 2

1 A) 1. d 2. a 3. d 4. c

B) 1. The backbone.

2. The brain.

3. Joints.

2 A) 1. d 2. c 3. a 4. b

B) 1. Because it controls thinking and memory and voluntary actions

2. Because they permit eating, drinking, writing and holding things.

3 A) 1. (X) movement

2. (X) slightly movable

3. (✓) 4. (X) upper limbs

B) 1. upper limbs.

2. 1. shoulder bones. 2. humerus.

3. forearm (radius - ulna). 4. rib cage.

3. Helps in activities like writing, eating and holding things.

4 A) 1. spinal cord

2. H

3. skull.

B) 1. Avoid stimulants.

2. Avoid sitting in front of the computer and television for a long period.

3. Avoid addiction.

## Monthly Exams Answers

P. 68

## October Models

## Model 1

- |         |         |         |         |
|---------|---------|---------|---------|
| 1. (a)  | 2. (b)  | 3. (d)  | 4. (a)  |
| 5. (b)  | 6. (c)  | 7. (a)  | 8. (d)  |
| 9. (a)  | 10. (d) | 11. (a) | 12. (c) |
| 13. (a) | 14. (c) | 15. (b) | 16. (b) |
| 17. (c) | 18. (c) | 19. (b) | 20. (c) |

## Model 2

- 1 1. chemicals – jewelry  
2. weightless  
3. hot and cold  
4. 35°C – 42°C  
5. liquid - good

- 2 1. (c) 2. (a) 3. (a)  
4. (a) 5. (d)

- 3 A. 1. Because as the mass of the object increases, its weight increases.  
2. To kill microbes.

B. 1. Mass on Earth =  $\frac{600}{10} = 60 \text{ kg}$

2. Mass on the moon = 60 kg

3. Weight on the moon =  $\frac{600}{6} = 100 \text{ N}$

- 4 A. 1. The weight of the object increases.  
2. We can't handle them easily.

- B. 1. (c)  
2. (e)  
3. (b)  
4. (f)  
5. (d)  
6. (a)

## Model Answers

## November Models

## Model 1

- |         |         |         |         |
|---------|---------|---------|---------|
| 1. (b)  | 2. (b)  | 3. (a)  | 4. (b)  |
| 5. (a)  | 6. (c)  | 7. (a)  | 8. (a)  |
| 9. (a)  | 10. (b) | 11. (b) | 12. (c) |
| 13. (b) | 14. (a) | 15. (b) | 16. (c) |
| 17. (d) | 18. (b) | 19. (d) | 20. (c) |

## Model 2

1. water  
2. magnesium oxide -carbon  
3. gas  
4. respiration -burning  
5. CO<sub>2</sub>

2. 1. (b)  
2. (d)  
3. (a)  
4. (a)  
5. (a)

3. 1. Acetylene gas  
2. Burning  
3. Limewater  
4. Hydrochloric acid  
5. Nitrogen gas

4. A. 1. Nitrogen gas  
2. Oxygen gas  
3. Carbon dioxide gas  
B. 1. Because it dissolves in water.  
2. Due to the photosynthesis process which compensate the consumed oxygen.

## December Models

## Model 1

- |         |         |         |         |
|---------|---------|---------|---------|
| 1. (a)  | 2. (a)  | 3. (d)  | 4. (a)  |
| 5. (a)  | 6. (a)  | 7. (a)  | 8. (a)  |
| 9. (c)  | 10. (a) | 11. (d) | 12. (d) |
| 13. (b) | 14. (c) | 15. (b) | 16. (c) |
| 17. (d) | 18. (c) | 19. (b) | 20. (b) |

## Model 2

1. Nervous system  
2. Movement  
3. skull - backbone - ribcage  
4. Dendrites  
5. Cerebellum

2. 1. (b) 2. (d) 3. (b)  
4. (a) 5. (d)

3. A. 1. Nervous system  
2. Spinal cord  
3. Backbone  
B. 1. It is responsible for the involuntary movements.  
2. It protects the brain.

4. A. 1. Because they allow the motion in all directions  
2. To prevent the friction between them  
B. 1. medulla oblongata  
2. shoulder bone 3. spinal cord